

**Maintain**<sup>®</sup>  
**Pool Pro**

**WATER CARE  
BOOKLET**

*Water Care Made Easy*

# KNOW YOUR POOL CAPACITY

Knowing your pool's capacity is the beginning to a successful water treatment plan.

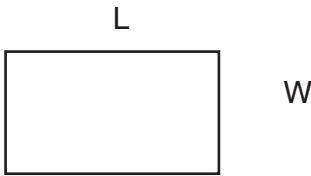
## Step 1-

Average Depth =  $\frac{\text{depth of the deep end} + \text{depth of the shallow end}}{2}$

## Step 2-

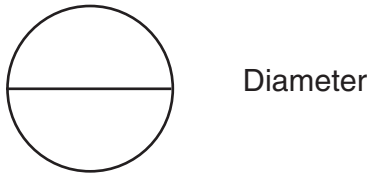
Rectangle or square pool =

length x width x average depth x 7.5 = pool volume



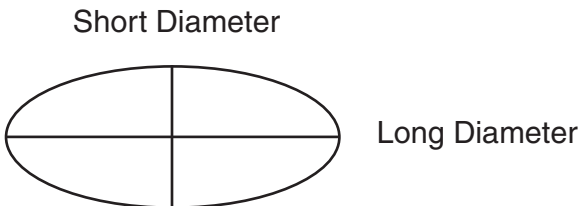
Circular Pool =

diameter x diameter x average depth x 5.9 = pool volume



Oval Pool =

long diameter x short diameter x average depth x 5.9 = pool volume



## **pH BALANCE**

Simply put, pH is the measure of acid vs. base of a solution. In your case, the solution is your pool water. The ideal range for pH is 7.2 to 7.6.

Your pH objective is to find the proper pH range for maximum swimming comfort and sanitizer effectiveness. First, you need to be familiar with the pH scale. The pH scale runs from 0 to 14 with 7.0 being the neutral point. Pure distilled water has a pH of 7.0 and is said to be pH neutral, neither acidic nor basic.

When the pH falls below 7.0, your pool becomes acidic. This means your water will become aggressive to pipes, vinyl and plaster pool walls, and metal components in heaters, pumps and filters. All of these elements may become corroded. Low pH water also causes skin and eye irritation, making the eyes look red. In addition, the sanitizer becomes very active which results in higher effectiveness, but has a rapid depletion rate.

High pH can also create problems of its own. When pH values climb too high (7.8 and up), the pool water has a tendency to look dull or flat. High pH can also cause skin and eye irritation. When the pH rises, the sanitizer becomes less effective. This means the pool will require more sanitizer to keep it clean.

The pH of pool water has a great effect on how comfortable it is for swimmers. Your eyes have a pH of about 7.3 to 7.5. As mentioned above, when the pH strays too far away from this point, pool water becomes increasingly uncomfortable. Red, irritated eyes are an indication that the pH might be out of balance and should be checked.

Taking all this into consideration, you will best meet your objective by keeping the pH between 7.2 and 7.6. This range combines the maximum swimmer comfort with sanitizer effectiveness.

## ADJUSTING pH

The control of pH is relatively simple. The pH can be raised with the addition of Maintain Pool Pro® pH Increaser (sodium carbonate). Sodium bicarbonate can also be added. Sodium carbonate or soda ash and sodium bicarbonate are the most commonly used products and can be safely mixed into the pool water.

The addition of acid such as hydrochloric acid (muriatic acid) or acid salts (sodium bisulfate) lowers the pH in your pool. Maintain Pool Pro® pH Decreaser (sodium bisulfate) is often recommended because it is safe to handle.

The charts below will help you determine the proper amount of chemicals that are needed to adjust the pH to the appropriate range. When using these charts, it is always best to add small amounts of chemicals over time, rather than large amounts all at once.

### *Recommended Dosage of Maintain Pool Pro® pH Increaser*

	<b>Test Reading Results for pH Level:</b>		
<b>Pool Capacity</b>	<b>6.8 – 7.2</b>	<b>6.5 – 6.8</b>	<b>Below 6.5</b>
<b>5,000 gallons</b>	<b>6 oz.</b>	<b>1.40 lbs.</b>	<b>2.00 lbs.</b>
<b>10,000 gallons</b>	<b>12 oz.</b>	<b>2.80 lbs.</b>	<b>3.80 lbs.</b>
<b>15,000 gallons</b>	<b>18 oz.</b>	<b>4.25 lbs.</b>	<b>5.50 lbs.</b>
<b>20,000 gallons</b>	<b>1.50 lbs.</b>	<b>5.50 lbs.</b>	<b>7.50 lbs.</b>
<b>30,000 gallons</b>	<b>2.25 lbs.</b>	<b>8.50 lbs.</b>	<b>11.25 lbs.</b>

### *Recommended Dosage of Maintain Pool Pro® pH Decreaser*

	<b>Test Reading Results for pH Level:</b>		
<b>Pool Capacity</b>	<b>7.6 – 7.9</b>	<b>8.0 – 8.4</b>	<b>Above 8.4</b>
<b>5,000 gallons</b>	<b>4 oz.</b>	<b>8 oz.</b>	<b>12 oz.</b>
<b>10,000 gallons</b>	<b>8 oz.</b>	<b>1.0 lbs.</b>	<b>1.5 lbs.</b>
<b>15,000 gallons</b>	<b>12 oz.</b>	<b>1.5 lbs.</b>	<b>2.2 lbs.</b>
<b>20,000 gallons</b>	<b>1.0 lbs.</b>	<b>2.0 lbs.</b>	<b>3.0 lbs.</b>
<b>30,000 gallons</b>	<b>1.5 lbs.</b>	<b>3.0 lbs.</b>	<b>4.5 lbs.</b>

## **TOTAL ALKALINITY**

Total Alkalinity is the measure of the pH buffering capacity or the water's ability to resist a change in the pH. The ideal range for total alkalinity is 80 – 120 ppm.

Pool owners must realize that Total Alkalinity, or T.A., is completely different from the alkaline or basic side of the pH scale. They are, however, related to one another for proper pH balance.

As mentioned earlier, a desirable pH range is between 7.2 and 7.6. Total Alkalinity plays a major role in stabilizing the pH. When T.A. values are within the proper range, the pH becomes stable. In other words, the pH will remain strong or consistent without great fluctuation. When T.A. values fall below the recommended range, the pH is easily effected. Even a small amount of high or low pH material introduced into the water can result in large swings in pH values.

Generally when T.A. is low, the pH remains low as well, causing your pool water to be corrosive and irritating to swimmers. At high T.A. levels, small additions of calcium can produce scale. The pH tends to remain high and attempts to lower pH are short lived.

Total Alkalinity is measured with a pool test kit or test strip, and for all practical purposes is equal to the measure of carbonates dissolved in the pool water. To adjust T.A., you must adjust the amount of carbonates. To raise T.A. values, you will need to add Maintain Pool Pro® Alkalinity Increaser (sodium bicarbonate). Sodium bicarbonate (with pH of only 8.2) will raise the T.A., but has a moderate effect on the pH of the pool.

To raise the Total Alkalinity level, either broadcast the Maintain Pool Pro® Alkalinity Increaser over the pool, or pre-dissolve it in water and pour the mixture evenly around the water's edge.

Lowering T.A. is a little more involved. You will need either Muriatic Acid or Maintain Pool Pro® pH Decreaser. Instead of broadcasting the acid over the pool water as for pH adjustment, you must pour the acid in one spot or column at the deep end of the pool. This method causes a different chemical reaction in the water which will lower the Total Alkalinity, instead of only reducing the pH level.

Lowering T.A. is a slow process and usually requires repeated additions of acid. We recommend that you do not add more than one quart or one pound of acid per 10,000 gallons of water per day.

*Recommended Dosage of Maintain Pool Pro® Alkalinity Increaser*

	<b>To Raise Total Alkalinity Level By:</b>		
<b>Pool Capacity</b>	<b>10 ppm</b>	<b>20 ppm</b>	<b>30 ppm</b>
<b>5,000 gallons</b>	<b>.75 lbs.</b>	<b>1.5 lbs.</b>	<b>2.25 lbs.</b>
<b>10,000 gallons</b>	<b>1.50 lbs.</b>	<b>3 lbs.</b>	<b>4.5 lbs.</b>
<b>15,000 gallons</b>	<b>2.25 lbs.</b>	<b>4.5 lbs.</b>	<b>6.75 lbs.</b>
<b>20,000 gallons</b>	<b>3 lbs.</b>	<b>6 lbs.</b>	<b>9 lbs.</b>
<b>30,000 gallons</b>	<b>4.5 lbs.</b>	<b>9 lbs.</b>	<b>13.5 lbs.</b>

*Recommended Dosage of Maintain Pool Pro® pH Decreaser*

	<b>To Lower Total Alkalinity By:</b>		
<b>Pool Capacity</b>	<b>10 ppm</b>	<b>20 ppm</b>	<b>30 ppm</b>
<b>5,000 gallons</b>	<b>1 lb.</b>	<b>2 lbs.</b>	<b>3 lbs.</b>
<b>10,000 gallons</b>	<b>2 lbs.</b>	<b>4 lbs.</b>	<b>6 lbs.</b>
<b>15,000 gallons</b>	<b>3 lbs.</b>	<b>5 lbs.</b>	<b>7 lbs.</b>
<b>20,000 gallons</b>	<b>4 lbs.</b>	<b>6 lbs.</b>	<b>8 lbs.</b>
<b>30,000 gallons</b>	<b>6 lbs.</b>	<b>8 lbs.</b>	<b>10 lbs.</b>

## CALCIUM HARDNESS

The term “water hardness” originated with the use of soap for laundering and cleaning. Certain ions in water combined with the chemicals in soap to form a solid precipitate, or scum, and made it difficult to get soap to lather. Thus water, with more than 100 ppm of hardness ions, was called hard water.

Like pH and Total Alkalinity, Calcium Hardness effects the water’s tendency to be scale forming or corrosive. The ideal range is 200 ppm – 400ppm.

When scale is formed in soft water, the scale is generally large and coarse. This is seen in many tap water pipes where the local water treatment plants soften the water to 100 ppm or less. Hard water, however, appears to produce a protective scale that has smaller, finer particles that prevent corrosion. Thus Calcium Hardness should be maintained at 200 ppm or higher to provide sufficient calcium saturation and to insure that if scale does form, it is the less harmful form.

To raise Calcium Hardness in the pool, add the proper amount of Maintain Pool Pro® Hardness Increaser, using the chart below. For those with extremely high calcium hardness (over 1000 ppm), the pool must be partially drained and refilled with water that is lower in total hardness.

### *Recommended Dosage of Maintain Pool Pro® Hardness Increaser*

<b>Chemicals Needed To Raise Calcium Level By:</b>					
<b>Pool Capacity</b>	<b>10 ppm</b>	<b>20 ppm</b>	<b>30 ppm</b>	<b>40 ppm</b>	<b>50 ppm</b>
<b>5,000 gallons</b>	<b>8 oz.</b>	<b>15 oz.</b>	<b>1.3 lbs.</b>	<b>1.8 lbs.</b>	<b>2.3 lbs.</b>
<b>10,000 gallon</b>	<b>1.0 lbs.</b>	<b>2.0 lbs.</b>	<b>3.0 lbs.</b>	<b>4.0 lbs.</b>	<b>4.5 lbs.</b>
<b>15,000 gallon</b>	<b>1.3 lbs.</b>	<b>2.8 lbs.</b>	<b>4.0 lbs.</b>	<b>5.5 lbs.</b>	<b>6.8 lbs.</b>
<b>20,000 gallon</b>	<b>1.8 lbs.</b>	<b>3.6 lbs.</b>	<b>5.4 lbs.</b>	<b>7.2 lbs.</b>	<b>9.0 lbs.</b>
<b>30,000 gallon</b>	<b>2.7 lbs.</b>	<b>5.4 lbs</b>	<b>8.1 lbs.</b>	<b>11 lbs.</b>	<b>14 lbs.</b>

## **PUTTING IT ALL TOGETHER**

Water balance is the first step to a clean, clear pool.

Having the correct balance will greatly reduce the effects of corrosion and scale build-up. It will also add to the enjoyment of your pool by enhancing the look, feel and smell of the water.

Water balance is the correct combination of pH, Total Alkalinity and Calcium Hardness working together to prevent corrosion. The thing to remember is proper water balance is relatively easy to achieve and should be a priority from the smallest back yard pool to the largest water park.

### Proper Ranges

pH 7.2 to 7.6

T.A. 80 to 120 ppm

C.H. 200 to 400 ppm

## **SANITIZING WITH CHLORINE**

Sanitization is the process of destroying organisms that are harmful to swimmers. Organisms, referred to as pathogens, include: bacteria, fungi, viruses, etc. Pool water, when left untreated, may develop these pathogens along with algae. Algae is unsightly and can cause the pool area to become slippery and unsafe. Routine sanitizing with chlorine will help eliminate growth of pathogens and algae.

All chlorine, regardless of whether it is introduced as a dry compound or a liquid compound, does exactly the same thing when added to water. It forms Hypochlorous Acid and Hypochlorite Ions. Hypochlorous acid is the stronger form of chlorine, also referred to as good chlorine. The hypochlorite ion is about 25 times less effective as a sanitizer but combines with the hypochlorous acid to give us Free Available Chlorine.



Free available chlorine is the measure of chlorine's active disinfecting power. Assuming the pool water is properly balanced, there is no need to have large amounts of chlorine dissolved in your pool for normal sanitation. A residual of 1 to 3 ppm of free available chlorine is sufficient to destroy algae and bacteria.

Choosing a Maintain Pool Pro® Chlorine to use is a matter of personal preference.

Maintain Pool Pro® Dichlor Granular - This type of chlorine is great for above ground or smaller pools that need a little more control over the amount of chlorine being dissolved into the pool. With Maintain Pool Pro® Dichlor Granular, you can put in as much or as little as you need to keep your pool safely sanitized at all times.

Maintain Pool Pro® 1" Small Tablets - The small tablets are terrific for automatic chemical feeders. They are slow dissolving and easy to handle.

Maintain Pool Pro® 3" Giant Tablets - The 7 or 8 ounce giant tablets are individually wrapped and are the perfect skimmer puck. These slow dissolving tablets are great for larger pools that need a more consistent flow of chlorine.

Maintain Pool Pro® Sticks - Just like the 3" tablets, the sticks are superb for the skimmer.

All Maintain Pool Pro® chlorine tablet products are stabilized for maximum sunlight protection and cost efficiency.

## **OXIDATION / SHOCK / SUPERCHLORINATION**

Oxidation is the process of chemically removing organic debris, such as body waste, particulate matter and perspiration, from the water.

There are two things needed to maintain a clean, clear pool: Filtration and Sanitization. The use of chlorine is supplemental to filtration. When working properly, it will remove dirt and debris from the water. The filter is limited, however, to suspended particles. Even the best filter cannot remove dissolved impurities because they are not physically separate from the water.

As mentioned earlier, hypochlorous acid is the form of chlorine that provides sanitization. Hypochlorous acid is very active and will react with ammonia and other nitrogen-containing organic compounds (i.e., perspiration, urine, etc.) and form chloramines. This “combined chlorine” is 40 to 60 times less effective than free available chlorine.

Combined chlorine, in addition to reduced effectiveness against bacteria can cause eye irritation and so-called “chlorine odor.” This may also result in a dull or flat look to your pool. A properly balanced and chlorinated pool will have no discernible odor.

When chloramines and organic debris have built up in your pool, you must chemically shock the pool to oxidize or burn the impurities out of the water. To achieve this you will need to raise the chlorine level 8-10 ppm above the normal chlorine residual to oxidize these organic compounds. This will kill and remove algae and other contaminants from the water.

Using Maintain Pool Pro® Liquid Shock or dry Shock products are the perfect way to regain that pool water shine.

An alternative method is to use a non-chlorine shock oxidizer to oxidize the organic contaminants from the pool water. This method will free up the regular sanitizer used and allow it to be more effective. Use Maintain Pool Pro® Oxy Plus as your non-chlorine shock oxidizer.

## **SUN LIGHT AND CHLORINE**

The sun is a natural enemy to chlorine residuals in your pool. It is said that on a sunny day, chlorine can be depleted at a rate of 5 ppm per hour. By controlling the consumption, you can help reduce your annual chemical costs. Cyanuric acid, also known as stabilizer and/or conditioner, is designed to reduce the sun's effects on chlorine.

Maintain Pool Pro® Conditioner/Stabilizer is a granular form of cyanuric acid. This product can be added to the pool in two ways. The first is to slowly pour the granules into the skimmer allowing them to be pulled into the filter. The second is to predissolve the material in a bucket of warm water and pour the solution around the perimeter of the pool. Whatever method you choose, the water must continue circulating in the pool for a minimum of 48 hours or until all the material is fully dissolved.

Maintain a cyanuric acid level of 20 to 40 ppm to help control chlorine consumption. If your pool is a saltwater pool, maintain your cyanuric acid level between 60 and 80 ppm. To raise cyanuric acid levels in the pool, simply add the proper amount of Maintain Pool Pro® Stabilizer/Conditioner. Check your level every other week, more frequently in a saltwater pool.

### *Recommended Dosage of Maintain Pool Pro® Conditioner/Stabilizer*

	<b>To Raise Stabilizer (cyanuric acid) Level By:</b>		
<b>Pool Capacity</b>	<b>10 ppm</b>	<b>20 ppm</b>	<b>30 ppm</b>
<b>5,000 gallons</b>	<b>0.5 lbs</b>	<b>1.0 lbs.</b>	<b>1.5 lbs.</b>
<b>10,000 gallons</b>	<b>1.0 lbs</b>	<b>2.0 lbs.</b>	<b>3.0 lbs</b>
<b>15,000 gallons</b>	<b>1.5 lbs.</b>	<b>3.0 lbs.</b>	<b>4.5 lbs</b>
<b>20,000 gallons</b>	<b>2.0 lbs</b>	<b>4.0 lbs.</b>	<b>6.0 lbs.</b>
<b>30,000 gallons</b>	<b>3.0 lbs</b>	<b>6.0 lbs.</b>	<b>9.0 lbs</b>

## **ALGAECIDES**

The chemistry of algaecides is complex because more than 46 species of clear water algae exist. Some algaecides work better on certain algae than others. Algaecides, or algae inhibitors, are commercial products that work hand in hand with chlorine to help prevent and control algae growth.

Planktonic clean water algae float on the surface, while other types of algae will attach themselves to the pool bottom or sides. Sunlight, temperature, pH, chlorine residual and mineral content of the water will all effect the presence and growth rate of algae. Algae can be introduced into the pool by wind-borne debris, rain and falling leaves, or they may be present in the fill water itself. It is even possible to transfer algae via bathing suits, floats, etc.

There are many different types of algaecides on the market today. The key to choosing the right one is to follow the manufacturer's directions and maintain a working level of algaecide in the water as you would chlorine. Although you are not able to test for algaecide levels in the water, proper use will be an effective deterrent to algae growth.

A common type of algaecide is what we call quaternary ammonium compounds, or "quat." Quats come in various mixtures and concentrations and are very effective algae inhibitors. Quat compounds may also cause foam on the surface of the water due to their ability to decrease surface tension. The foam is normal and short lived. Other types will include a polymer additive to prevent the water from foaming. These we refer to as "polyquats." Still others have a copper, silver or even magnesium additive in them to get those hard to kill algae such as mustard, pink slime or black algae.

The Maintain Pool Pro® pool maintenance product line offers a selection of everyday algaecides. These include: Maintain Pool Pro® 10% Algaecide, Maintain Pool Pro® 30% Non-foaming Algaecide, Maintain Pool Pro® 50% Algaecide, Maintain Pool Pro® 60% Non-Foaming Algaecide and Maintain Pool Pro® Algae Prevention & Remover.

## **CLARIFIERS AND FLOCCULANTS**

Maintain Pool Pro® Clarifier is a maintenance product that will help filter out suspended particles that cannot be oxidized. Made of Polyelectrolyte, clarifiers use the art of attraction to bind small particles together. This may seem quite simplistic but there is really nothing else to it.

Clarifiers come in a variety of concentrations. Generally speaking, all clarifiers will perform well, but it is important to use them as the manufacturer suggests. A weak concentration in the pool will not yield satisfactory results, while using too much may cause shortened filter runs. Most clarifiers work best when diluted in 3 to 5 gallons of water and distributed evenly around the pool. This will insure a faster, even disbursement of the product throughout the pool.

Maintain Pool Pro® Flocculant is made of aluminum sulfate, commonly known as “alum.” It is used as a filter aid, a coagulant and a settling agent for turbid water. Alum floc is a white, gelatinous substance that attaches to free floating matter in the water to form larger, heavier-than-water particles, which settle to the bottom of the pool. Alum floc is especially effective on sand filter beds. The floc partially fills the voids in the sand beds and holds organic debris in its suspended gelatinous coating.

Alum used as a filter aid, is introduced to the pool at the most convenient point ahead of the filter system. The skimmer is generally used for this entry. To use the floc as a settling agent, simply broadcast the dry white powder over the surface of the water at a rate of 2 ounces per square foot of surface area (see pool calculations) and allow the pool to stand undisturbed overnight or for a minimum of two hours. After the debris has settled to the bottom, vacuum the pool on the waste or drain cycle to rid the pool of the unwanted matter.

## **WATER TESTING**

Regular and precise testing of swimming pool water is essential for maintaining a healthy, clean pool.

There have been many changes and improvements in water testing over the years from easier-to-read test kits to dip-and-read test strips. Whatever you choose, you should follow some basic rules when testing water. Careless testing procedures, inaccurate measurements, or bad reagents will cause problems. The following rules apply to all chemical testing.

1. Test the water frequently, sometimes daily when the pool is heavily used.
2. Make certain that the sample tested is representative of the pool water. Do not collect the sample from an area adjacent to an inlet. Try to select a location that contains well-mixed pool water, and attempt to get a sample from at least 12" below the water surface.
3. Follow instructions. Water testing is a precise process that demands accuracy in measuring amounts of reagents involved.
4. Add the water to the sample cell until the bottom of the bowl like surface (called a meniscus) is even with the indicated fill line. The outer edges will be higher than the center.
5. Rinse all sample cells, stirring rods and equipment thoroughly after each use, both inside and out with clean fresh water.
6. Do not handle the equipment with dirty hands, and especially do not cover the sample cell with your fingers. Store all equipment in a cool, dry place. Do not interchange parts such as cells, caps or droppers.

## **FILTRATION AND RECIRCULATION**

Water clarity, also known as turbidity, is the degree in which suspended particles in water obscure visibility. Filtration is the mechanical process of removing this insoluble matter from swimming pool and spa water.

Swimming pools and spas are subject to constant contamination from foreign matter brought in by wind, swimmers and articles used in and about the pool water. Such contamination includes particles of dirt, organic matter, bacteria, algae, hair, makeup, suntan and body oils, leaves, chemical residue and other debris.

Pool water carrying these types of debris are diverted into the filter chamber and pass through a filter media where the particulate matter is trapped. The clean, filtered water is then returned to the pool.

There are three main factors that determine water clarity.

1. Flow Rate - the amount of water that flows through the filter during a specified amount of time. This is measured in gallons per minute (gpm).
2. Amount of Filtering Area - Filter medium has limited capacity to trap and hold particulate matter, debris, oil, etc. The amount of filter area required for any given size pool is directly related to the gallons per minute that will be flowing through the filter.
3. Effectiveness of Filter Media - As previously stated, filter media has the ability to trap and hold particulate matter as water flows through it. The effectiveness of the filter media varies according to type. Generally speaking, the finer the medium, the more successful the filtering process. For example, Diatomaceous Earth is finer, therefore, more effective than sand.

Filter systems consist of several basic parts: a pump and motor to move the water, a hair and lint trap to remove large debris, a filter to remove particulate matter, and a piping system to conduct the water to and from the pool through the pump and filter. Filter system sizing is directly related to the amount of water in the pool. Health codes require that the entire volume of water be recirculated through the filter in an established period of time. An accepted standard is 6 to 8 hours. For example, a 20' x 40' pool containing 30,000 gallons of water should have a filter system large enough to handle a flow rate of 63 gallons per minute.

$$\frac{30,000 \text{ gallons}}{(8 \text{ hrs} \times 60 \text{ min/hr})} = \frac{30,000 \text{ gallons}}{480 \text{ minutes}} = 63 \text{ gal/minute (Flow Rate)}$$

This means that the pump has to be able to move 63 gallons per minute through the piping, into the filter, and return it to the pool.

The filter has to be large enough to accept 63 gallons per minute flowing through the medium without over-extending its capabilities. Filters are sized according to square feet of surface area. Each square foot can handle a certain amount of water flowing through it. For example, a high rate sand filter has a design capability of 12 gallons per minute for each square foot. Therefore, you would need 5.25 sq. ft. of surface area for a 30,000 gallon pool.

$$63 \text{ gpm} / 12 \text{ gpm/sq. ft.} = 5.25 \text{ sq. ft. of filter area required}$$

The effectiveness of the filter medium, in this case sand, will make a difference in water clarity. Other filter media, such as a cartridge type (made of synthetic fiber paper similar to a coffee filter), or Diatomaceous Earth powder (used by coating a filter screen), still must adhere to the flow rate of the pool. Generally accepted flow rates for these are as follows:

Cartridge - 0.375 gallons per minute per sq. ft.

Diatomaceous Earth - 2 gallons per minute per sq. ft.



## **SAFETY WITH STORAGE AND HANDLING**

Handling swimming pool chemicals is safe and easy when they are used and stored properly. Problems occur when careless mistakes are made. When mixed with incompatible materials, these important, everyday chemicals have the potential for disaster. By following some easy safety rules, accidents can be prevented.

### **FOR OUR CUSTOMERS**

1. FOLLOW instructions. USE chemicals only as instructed. ALWAYS KEEP CHEMICALS OUT OF REACH OF CHILDREN.
2. NEVER add water to chemicals - add chemicals to water slowly.
3. PROTECT eyes with glasses or a mask when handling chemicals.
4. NEVER mix different chemicals together. This can cause fire and toxic fumes.
5. ALWAYS use a clean dipper, free of oil, grease or insecticides. Even small amounts of residue can combine with the chemicals and produce a danger.
6. ALWAYS keep chemicals in their original containers, tightly sealed.
7. STORE your chemicals in a clean, dry, well-ventilated area away from household items such as fertilizer, gasoline, oil or other cleaning solutions.
8. ALWAYS clean up spills immediately with a clean broom or dust pan. Dispose of spilled materials in an over-pack container. DO NOT put spilled chemicals back in their original container. The chemical may have been contaminated.
9. KEEP chemicals away from electrical equipment and open flames.
10. NEVER FLUSH excessive amounts of chemicals down storm sewers. In case of large spills, contact your local fire department for assistance.

## **CHEMICAL SAFETY SUMMARY**

Acids-Acids are highly corrosive and must be handled with extreme care.

### Names of Acids

Muriatic acid (Hydrochloric acid), Sodium bisulfate (dry acid, pH down)

### Protective Equipment

- Eyes - goggles or full face shield when splashing may occur
- Hands - gloves (rubber, neoprene, or PVC)
- Body - coveralls and impervious boots
- Lungs - proper ventilation

### Handling Precautions

- DO NOT take internally.
- Avoid contact with eyes, skin or clothing.
- Upon contact with skin or eyes, rinse with water.
- Avoid breathing vapors (muriatic acid) and dust (sodium bisulfate).
- Store all containers in a cool, dry place.
- Always add acids to plenty of water. Never add water to acids.

### Conditions and Materials to Avoid

- Avoid contact with strong alkalis such as caustic soda, sodium carbonate, etc.
- Avoid contact with all oxidizers.
- Do not store in wet or moist conditions.

Balance Chemicals - Although acids are balance chemicals, they have been treated separately. The chemicals in this section are all basic (high pH) and increase pH, TA and/or Calcium Hardness.

### Names of Balance Chemicals

Sodium bicarbonate, Sodium carbonate, Calcium chloride Protective Equipment

- Eyes - goggles
- Hands - gloves (rubber, neoprene, or PVC)

### Handling Precautions

- DO NOT take internally.
- Avoid contact with eyes, skin or clothing.
- Avoid breathing dust, spray or mist.
- Store containers in a cool, dry place.
- Always keep containers tightly sealed.
- Caution: DO NOT mix balancing chemicals with anything other than water

## Conditions and Materials to Avoid

- Avoid contact with acids.
- Avoid contact with organics and oxidizers.
- Do not store near acids.

Oxidizers -The precautions for handling oxidizers are all similar. However, it is up to you to familiarize yourself with the requirements for each.

## Names of Oxidizers

Calcium hypochlorite (Cal hypo), Lithium hypochlorite, Sodium hypochlorite (Liquid shock, Bleach), Trichlor (1" and 3" Tablets), Sodium dichlor, Bromine, Potassium peroxymonosulfate (Oxy shock, Non-chlorine shock)

## Protective Equipment

- Eyes - goggles
- Hands - gloves (rubber, neoprene, or PVC)
- Lungs – provide ventilation where dust is likely.

## Handling Precautions

- DO NOT take internally.
- Avoid contact with eyes, skin or clothing.
- Upon contact with skin or eyes, rinse with water.
- Avoid breathing dust.
- Store all containers in a cool, dry place.
- Do not store containers in direct sun light.
- Do not store near combustible materials.
- Do not mix oxidizers.
- Use clean, dry utensils when handling oxidizers.
- Keep all oxidizer containers off wet floors.

## Conditions and Materials to Avoid

- Excessive heat – oxidizers will decompose, releasing toxic gasses and heat.
- Solvents
- Acids
- Other pool chemicals such as acids, algacides, clarifiers, sequestering agents, surface cleaners, etc.
- Organic materials
- Do not mix chemicals with anything other than pool water. Always add chemicals to plenty of water. Never add water to chemicals.