

Ask the Pool Guy's Everyday Guide to Swimming Pools



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Ask the Pool Guy's Everyday Guide to Swimming Pools

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Happy Pools. Happy Customers. Happy Pool Guy.

This book is dedicated to pool owners everywhere with special thanks to the Pool Guy's hard working team.

An extra special thank you to Monica, who tirelessly edited these words to get them ready for print, and to Jessie, whose quick wit and way with words continues to make a difference.

Preface

Your pool is an investment that you and your family can enjoy for many years. We have put together some information to help you maximize your enjoyment, and answer many of the common pool service and maintenance questions. Several topics are also great troubleshooting guides and will serve as a valuable reference for you as you enjoy your pool.

The swimming pool season in Michigan, where *Ask the Pool Guy* is located, typically runs from mid-April to mid-September. If you live in parts of the country where your season is longer, or even in the area where you don't winterize your pool, there is still plenty of information for you in this guide.

If you have any additional questions or problems, call our service hotline at 248-478-4978 or contact us via our website: www.AskThePoolGuy.com. We happily take calls and even pool design and build requests from around the country. We are prepared to help you troubleshoot, solve problems, and create the best swimming pool owner experience possible.

Happy Swimming!

Table of Contents

Index

New Pool Owner's Quick Start Guide	18
Basic Supply ✓ List:.....	18
New Pool Owner's Quick Notes	20
Information to keep Handy	20
Opening Your Swimming Pool	21
Step 1. Remove Your Pool Cover	22
<i>Plastic Covers</i>	22
<i>Safety Cover</i>	23
Step 2. Water Chemistry Check	25
Step 3. Just Add Water!.....	25
Step 4. Check Equipment & Plumbing	26
Step 5. Remove Debris from the Bottom.....	26
Step 6. Start Filtration System & Vacuum	27
Step 7. Shock Your Pool.....	27
Step 8. Stabilize Your Pool Water.....	27
Step 9. Sanitize Your Pool	27
Step 10. Prevent Algae	28
Step 11. Learn how to Save Time & Money!.....	28
Closing Your Pool	29
Final Chemical Additions.....	29
Final Routine Maintenance	30
Draining the Pool.....	30
What to Do While the Pool is Draining	31
Immediately After the Pool Is Drained	32
Blowing Water Out Of the Plumbing Lines.....	32
Installing a Safety Cover	36
Installing a Plastic/Water Bag Cover.....	37
Liability of Winterizing Your Own Pool	38
Winterizing an Aboveground Pool.....	39
Maintenance	41
Care of your Pool's Interior	41
Care for Cleaning Equipment and Accessories	41
Basic Maintenance Schedule	41
Daily Maintenance	43
<i>Pool Water Chemistry</i>	43
Weekly Maintenance	43
Monthly Maintenance	43
<i>Deck Equipment - Pool Handrails & Ladders</i>	43
<i>Pool Tile or Liner</i>	43

<i>Pool Water Chemistry</i>	44
Miscellaneous Maintenance	44
<i>Lubricating O-Rings</i>	44
<i>Regular Use Of The Heater</i>	44
<i>Brush Off/Hose Off Your Pool Deck</i>	44
Winter Months (Southern climates only)	45
More Specifics.....	46
<i>Using Pool Nets</i>	46
<i>Skimmer Basket(s)</i>	47
<i>Cleaning The Pump Basket</i>	48
<i>Brushing</i>	50
<i>Vacuuming</i>	51
Pump, Motor, Heater & Filter.....	55
Pool Pump & Motor.....	55
<i>Sizing Your Swimming Pool Pump</i>	55
<i>How Swimming Pool Pumps Work</i>	56
Heater.....	56
<i>To light the Pilot</i>	56
<i>If the Heater quits working</i>	57
Filter Systems	57
Maximizing Swimming Pool Filter's Potential.....	57
Multi-port Valves	58
<i>Filter Setting</i>	59
<i>Backwash</i>	59
<i>Rinse</i>	60
<i>Waste</i>	60
<i>Re-Circulate</i>	60
<i>Multi-port Valve Parts and Maintenance</i>	61
The Pressure Gauge.....	61
Sand Filter.....	62
<i>Sand Swimming Pool Filters</i>	62
<i>Backwashing - Cleaning A Sand Filter</i>	62
Diatomaceous Earth (D.E.) Pool Filters	64
<i>Backwashing & Bumping - A DE Filter</i>	64
<i>Bumping</i>	66
Cartridge Swimming Pool Filters.....	66
<i>Cleaning A Cartridge Filter</i>	67
Operations – Running Your System.....	68
Swimming Pool Water Chemistry	70

Your Test Kit Is Your Pool Buddy.....	70
Swimming Pool Water Chemistry Numbers	71
Quick Reference Ideal Numbers	71
Reading your test strip	71
Fresh Clear Pretty Water Still Needs to Be Balanced!	72
Water Chemistry Quick Reference:	72
Water Chemistry Quick Definitions:	73
Total Hardness: (Total Dissolved Solids)	73
FC – Free Chlorine	74
pH- Acidity/Alkalinity	75
TA – Total Alkalinity	75
CH – Calcium Hardness	77
CYA – Cyanuric Acid	78
<i>Pool water problems – copper, iron or manganese</i>	78
Adding Chemicals	79
pH	79
<i>How pH Affects Pool Water Chemistry</i>	79
<i>Poolside Testing</i>	80
<i>Why is pH so important?</i>	81
Total Alkalinity.....	82
<i>Calcium Hardness & Water Balance</i>	82
Dealing With Stain Producing Metals.....	83
Sanitizing Your Pool Water	84
<i>Chlorine</i>	84
<i>Bromine</i>	85
<i>Stabilized Chlorine</i>	86
<i>Conditioner/ Stabilizer- Protecting Chlorine</i>	87
Water Balance	87
Common Water Chemistry Problems	88
<i>Algae</i>	88
<i>Mustard Algae</i>	88
<i>Green Algae</i>	89
<i>Black Algae</i>	89
<i>Preventing Algae</i>	89
<i>Iron / Copper</i>	90
Automatic Pool Cleaners	91
<i>Why should you consider one</i>	91
Suction Side Automatic Pool Cleaner.....	92
Pressure Side Cleaner.....	92

Robotic Pool Cleaner.....	93
Troubleshooting.....	95
<i>Pump Suddenly Stops Working.....</i>	<i>95</i>
<i>Pump Only Hums</i>	<i>95</i>
<i>Pump runs but will not move water.....</i>	<i>95</i>
<i>Pump Is Loud</i>	<i>96</i>
<i>The Breaker Keeps Tripping.....</i>	<i>97</i>
<i>Short Filter Runs Between Cleanings</i>	<i>97</i>
<i>Sand Is On The Floor Of The Pool.....</i>	<i>98</i>
<i>DE Powder Is On The Floor Of The Pool.....</i>	<i>99</i>
<i>Heater Will Not Heat.....</i>	<i>99</i>
<i>Leak Detection At The Equipment.....</i>	<i>100</i>
<i>Leak Detection For The Structure Of The Pool.....</i>	<i>100</i>
<i>Underwater light goes out</i>	<i>100</i>
FAQ.....	101
Salt Chlorine Generating Systems!.....	101
<i>How Saltwater Pools Work.....</i>	<i>101</i>
<i>Taking Care of Your Saltwater Pool.....</i>	<i>102</i>
<i>Recommended Product: IntelliChlor Salt Chlorine Generator</i>	<i>102</i>
Calculating Water Volume.....	103
<i>Rectangle / Roman-End / Grecian / Square</i>	<i>103</i>
<i>Round.....</i>	<i>103</i>
<i>Kidney</i>	<i>103</i>
<i>Any L-Shape</i>	<i>104</i>
<i>Free Form Or Irregular Shapes</i>	<i>104</i>
How much water does my pool need?	104
Should I ever drain all of the water?.....	106
Why does it take so long to get help?	107
What if I buy a house with a pool?.....	109
GLOSSARY.....	111
<i>Algae</i>	<i>111</i>
<i>Algaecide.....</i>	<i>111</i>
<i>Algistat.....</i>	<i>112</i>
<i>Alkalinity Increaser</i>	<i>112</i>
<i>Automatic Vacuum Cleaners.....</i>	<i>112</i>
<i>Automatic Water Leveler.....</i>	<i>112</i>
<i>Backwash Hose.....</i>	<i>113</i>
<i>Bromine (BCDMH).....</i>	<i>113</i>
<i>Brush</i>	<i>113</i>

<i>Calcium Hardness</i>	114
<i>Calcium Hardness Increaser</i>	114
<i>Calcium Hypochlorite</i>	114
<i>Cement</i>	115
<i>Chlorine - Cl₂</i>	115
<i>Chlorine Alternatives</i>	115
<i>Chlorine Demand</i>	115
<i>Chlorine Donor</i>	115
<i>Chlorine Lock</i>	116
<i>Chlorine Residual</i>	116
<i>Chlorine Stabilizer</i>	116
<i>Clarifier</i>	117
<i>Combined Chlorine Or Chloramines</i>	117
<i>Cover Cleaner</i>	117
<i>Cyanuric Acid</i>	118
<i>Defoamer</i>	118
<i>Dichlor</i>	118
<i>Enzyme Cleaner</i>	119
<i>FerriTabs</i>	119
<i>Filter Cleaner</i>	120
<i>Garden Hose Operated Vacuum</i>	120
<i>Gunitite</i>	121
<i>Hard Water</i>	123
<i>Hybrid Swimming Pool</i>	123
<i>Hypobromous Acid (Free Bromine)</i>	123
<i>Hypochlorite Ion (OCl⁻)</i>	123
<i>Hypochlorous Acid - HOCl</i>	124
<i>Langlier Saturation Index</i>	124
<i>Manual Vacuum Assembly</i>	124
<i>Metal Sequestering Agent</i>	125
<i>Muriatic Acid</i>	125
<i>Nets</i>	125
<i>Ozone</i>	126
<i>Parts Per Million (ppm)</i>	126
<i>pH</i>	126
<i>pH Decreaser</i>	126
<i>pH Increaser</i>	127
<i>Pool Filtration System (Example)</i>	128
<i>Pool Filtration Diagram</i>	128

<i>ppm</i>	128
<i>Salt System</i>	128
<i>Shock</i>	129
<i>Shock Chlorine</i>	129
<i>Shotcrete</i>	130
<i>Soda Ash</i>	130
<i>Soft Water</i>	130
<i>Superchlorination</i>	130
<i>Test Device</i>	130
<i>Tile & Vinyl Cleaner</i>	131
<i>Total Alkalinity</i>	131
<i>Total Chlorine</i>	132
<i>Total Dissolved Solids (TDS)</i>	132
<i>Trichlor</i>	134
<i>Vacpole</i>	134
<i>Water Balance</i>	134
<i>Zinc Anode</i>	134
<i>Zoo</i>	135
About the Author	136

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New Pool Owner's Quick Start Guide

Basic Supply ✓ List:

If you're new to the swimming pool world, you might be wondering what you'll need to get started with your pool. What chemicals should you have on hand? What equipment will you need? When you first walk into or click around in a pool store, it's easy to be overwhelmed by the amount of products you can choose. The list of things you'll need on a regular basis, though, is pretty manageable. Here's a basic list of supplies you should keep around. All of these items and their use is described in this book.

Phone Numbers: The most important thing for you to have is the phone number to your local pool professionals, for service, chemicals, answers to your questions, and especially troubleshooting.

Vac (Vacuum) Head: You'll use the vac head (attached to a pole and hose) to keep your pool clean and free of debris.

Vac Hose: The vac hose attaches to the vac head and provides the suction needed to vacuum your swimming pool.

Pole: The adjustable-length pole attaches to your vac head, brush, and leaf skimmer interchangeably. It is extendable to accommodate different pool depths and allow you to reach almost all areas of your pool without getting in.

Brush Head: Attached to your pole, you brush the sides of your pool and keep them clean.

Leaf Skimmer: The leaf skimmer attaches to the pole as well and allows you to skim leaves and debris (and bugs...gross!) from the surface of your pool.

Test Strips: Test strips will help you keep your water levels in check – they'll tell you the levels of chlorine, pH, and total alkalinity. This will let you know what chemicals you need to add to keep your pool clean, safe, and swimmable.

Stabilizer: Stabilizer is a chemical that helps prevent chlorine dissipation due to sunlight. Intense sunlight can make it hard to maintain proper chlorine levels, so if your swimming pool is in direct sunlight you may need to use a stabilizer.

Alkalinity Plus: Alkalinity+ raises the total alkalinity of your pool. Alkalinity that is too low can cause your pH levels to fluctuate excessively.

Calcium Hardness Increaser: Calcium hardness increases water hardness to prevent surface etching, foaming, equipment corrosion, and scaling.

pH Plus: pH+ raises the pH level of your pool water. The proper range (7.2-7.8) will allow your sanitizer to work more effectively, reduce equipment corrosion, reduce eye irritation, and reduce skin dryness.

pH Minus: pH- lowers the pH of your pool water. It's important to keep your water in the proper pH range to optimize system performance, reduce corrosion, and reduce eye and skin irritation.

Algaecide: algaecide controls and prevents all types of pool algae; a maintenance dose should be added weekly to the pool.

New Pool Owner's Quick Notes

Information to keep Handy

Here are the things you will need to know about your pool to have ready when talking to your pool company:

1. Is the Pool an In-Ground or Above Ground Pool?
2. What is the pool construction?
 - a. Vinyl Liner
 - b. Gunite
 - c. Fiberglass
 - d. Hybrid
3. What are the dimensions of the pool?
 - a. Length
 - b. Width
 - c. Depth
4. What is the volume of the pool in gallons?
5. When was the pool built?
6. How old is the liner or the tile/coping?
7. How old is the equipment/mechanicals?
8. What type of cover is used when winterizing the pool?
9. Any special notes:

Opening Your Swimming Pool

There is nothing more exciting in the swimming pool industry than when spring arrives and the swimming pool can be opened. Of course, those of you in warmer southern climates don't ever have to close the pool, so you can avoid this part all together. (Lucky you!)

1. Remove Your Pool Cover
2. Water Chemistry Check
3. Just Add Water!
4. Check Equipment & Plumbing
5. Remove Debris from the Bottom of Swimming Pool
6. Start Your Filtration System & Vacuum
7. Shock Your Pool
8. Stabilize Your Pool Water
9. Sanitize Your Pool
10. Prevent Algae
11. Learn how to Save Time and Money!



Here is a much more detailed description of these steps:

Step 1. Remove Your Pool Cover

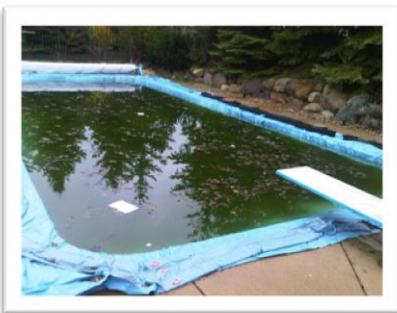
If you have a solid winter cover, be sure to drain as much of the water, sitting on top of the cover, as possible before removing it. This is most easily accomplished using a cover pump. Be careful while performing this step; any hole in your pool cover might cause you to pump out more water than you really need to.

This is a serious issue for fiberglass or gunite pool owners, so please, watch what you are doing! As you might tell your Barber, just a little off the top, please. How serious? See the photo on the right. This is called a pop-out and it's a major repair.



Plastic Covers

Does your pool look like this?



The pool cover used on this pool is a standard plastic cover with water-bags.

Benefits of using a plastic cover are that it's a relatively inexpensive way to cover your pool and the cover doesn't need to be custom fit for coverage.

Water underneath a plastic cover, providing there are no holes in the cover to allow the dirty water through, will allow for clear water underneath when you open it for the spring.

Drawbacks of plastic covers are that they are not the safest option available (think large plastic bag on your pool) causing a potential hazard for animals and children. If you also consider that people



want to be as economical as possible, the cover manufacturers have also follow suit. The cover manufacturers have been making plastic covers that last only a season or two because, to make them cheaper, they are making the weave less tight and the materials are not as thick as they could be.

A plastic cover will be good for about 3 years, with great care. You'll also be purchasing water-bags to go around the edge of the pool. A number of bags will go bad over the winter (holes, tears, and leaks), so you will be investing in new water-bags every year. Some homeowners try to add cinderblocks or patio stones around the pool to anchor the cover. As logical as this sounds to the new pool owner, *this is not a good idea*. Anything falling into your pool can cause damage to the pool surface (especially a vinyl liner pool) so the money you save by using these anchors might result in a much more expensive repair or even the replacement of your liner. You will still have to pump the water off the cover for the spring opening and need to refill the pool to operational levels for the season.

Safety Cover

Let's take a look at the opening of a safety covered pool.

The cover is an investment, but the payoffs are *huge!* The covers are designed to support a person's weight and may be tempting to trampoline wannabe artists, however using a safety cover that way will wear down the cover at the edge of the pool and might cause a failure when you need it most. As fun as it looks, don't do it.



One big benefit with a Safety Cover is that rain and melted ice & snow seep through the cover. No water to pump off at opening and the pool is full!



Using special tools, the crew (say hi to Rick!) will release the springs from the grommets that recess into the patio for summer. [\(Video Available On-Line\)](#) Screw grommets or anchors down so they are flush with your patio *before* you move the cover so that you

don't catch and snag the cover. Carefully pull the cover off the pool, and take it aside to be cleaned and left to dry, before rolling it up for storage. This can be done by one person, but it's a lot more fun with two. Note: Although you can put your safety cover on at any time, it is usually considered too cumbersome to take off (and back on) every time you wish to use the pool.

With either type of cover, once you've drained the water off and removed the pool cover we recommend using a cover cleaner to remove all dirt and grime from the cover. Make sure your pool cover is completely dry before folding it and storing, it in a dry place, ready for closing up your pool in the fall.

Our opening crew recently opened this vinyl liner pool, and while we could describe it to you, perhaps a photo series is worth even more.

Wow, this is going to be fun! Notice the swimming pool, plastic cover, water-bags, and leaves buried in the murky water.

The Crew used a large trash pump with 3" hoses to remove the water from the top of the cover, while



scooping leaves off the top.

Progress! We've gotten the water and the leaves off the cover, now we can remove the water-bags and carefully pull the cover off the pool.

The cover is off, there is a bit of murky water under the cover, this could be due to small holes in the cover allowing water through. It's good to get a new cover when this happens.



While water is being added to the pool to bring it back up to operational level, the crew vacuums the pool to get fine debris and leaves off the bottom. This helps immensely with water clarity and sets the homeowner up for an enjoyable spring.

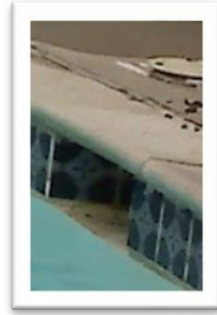
Step 2. Water Chemistry Check

Knowing the chemistry of the water you will add to your swimming pool is essential. The good news is that testing your pool water is easier than ever before! Find a swimming pool water testing method you're comfortable with, whether it is test strips or a test kit, and record your results. A record will help you to keep track of the chemicals you use and, especially, how much is the right amount for your pool. If more than one person uses your chemicals, this record can save you a lot of aggravation... and money! (Pencil is better than pen, which may run if splashed.)



Step 3. Just Add Water!

Add enough fresh water to bring your swimming pool to the desired height which is typically about $\frac{3}{4}$ of the way full, in your skimmer. This allows debris to pass into the skimmer and allows enough water to flow through so your system doesn't get any air infused during full operation. This is too low and the debris can't get into the skimmer.



Step 4. Check Equipment & Plumbing

Before you start up your swimming pool pump and filter system, be sure that all lines are open. Make sure the pump and skimmer baskets are in place and free from debris. Remove any “plugs” that may have been put in place to keep water out of the plumbing. Follow your manufacturer's guidelines for starting up your pool heater, pool filter, and pump. Make sure to start each new season with a clean filter.



The valve on the left is open. The one on the right is closed.

The valve on the left is open. The

Step 5. Remove Debris from the Bottom

Remove leaves, twigs, and other large debris from the pool's bottom using a leaf rake. (A pool Leaf Rake has no tines. It's the bigger skimming net. Do not use a regular rake; you will damage your pool surface.) If you cannot see the pool bottom it is important that you perform this step especially well. The reason for this is that chlorine shock seeks out contaminants to oxidize, including leaves; so much of the chlorine will be consumed if the pool bottom is not well cleaned. A cloudy pool which is free of



debris is much easier, and less expensive, to clear up, and shock treatment is more effective.

Step 6. Start Filtration System & Vacuum



Once your swimming pool is full, you can prime your pump and start the filtration process, while circulating the water. Once the system is up and running, you can hook up your manual vacuum. Skip this step if you have a handy dandy automatic pool cleaner (Note: most automatic cleaners work best in pool water that is over 55 degrees). Brush down the walls to

loosen any debris at the waterline, and to allow the chemicals to reach all areas of the pool and do their work.

Step 7. Shock Your Pool

When the swimming pool is free of debris you will want to shock treat the water by adding 1 pound of chlorinated shock treatment, per 10,000 gallons. (Yes, there are just too many good jokes one could insert here.) Follow label directions for the proper way to introduce the shock treatment to your pool. Be careful, especially with a vinyl liner pool, not to just dump granular chlorine into the pool. It can sink to the bottom and, if it sits on the liner for an extended period of time, it can cause bleaching and discoloration of the liner.

Step 8. Stabilize Your Pool Water

Swimming pool water needs to be stabilized or "conditioned" to prevent the rapid loss of chlorine because of the sun's UV rays. This will help reduce chlorine usage throughout the season. In other words, save you time and money. Add the recommended amount of stabilizer by dissolving it in a bucket of water before adding it to the pool.



Step 9. Sanitize Your Pool

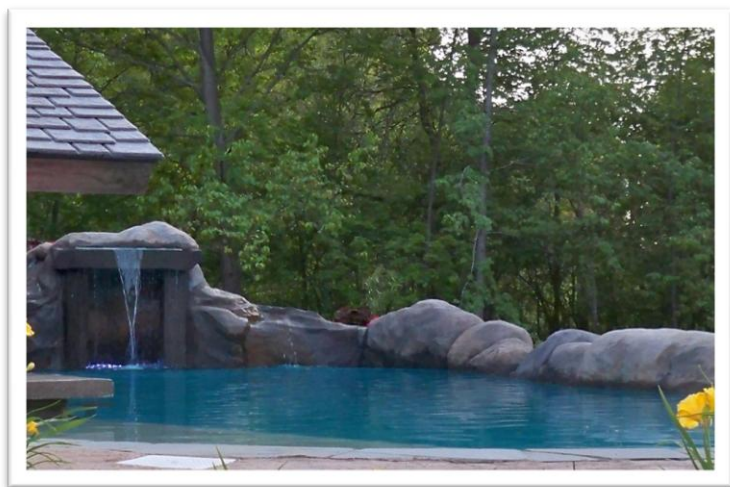
Now you can begin to sanitize your pool water. Many swimming pools that are being installed these days, are utilizing chlorine generating systems (salt water pools) to chlorinate your swimming pool. So you can have your pool automatically generate the chlorine it needs resulting in a better pool experience. Regardless, when starting your pool for the season, it's good to give the pool a "shock" treatment and use twice the normal dosage indicated for your pool's capacity or use an automatic feeder. Allow pool water to circulate overnight for good distribution and filtration.

Step 10. Prevent Algae

Using an algaecide not only kills existing algae but will also prevent algae from entering your pool. Once algae is dead a settling agent can be used to remove it from the pool.

Step 11. Learn how to Save Time & Money!

Now would be a great time for you to research time and money savers such as salt systems, automatic pool cleaners, and even a weekly maintenance visit from your swimming pool professional. Swimming pool service and maintenance can be quick and easy. Look to your local swimming pool service company for assistance. Many of them offer new user training for the cost of a service call.

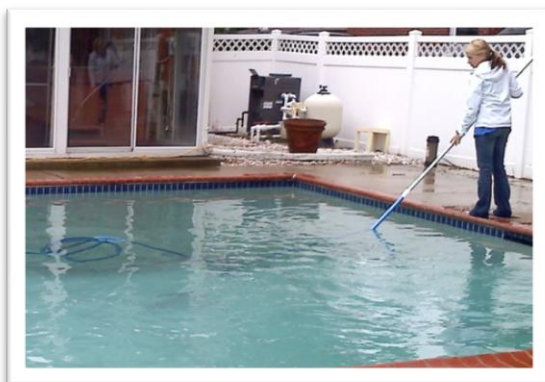


Closing Your Pool

If you use your pool year-round, because of milder southern climates or your willingness to pay for heating your water during the cold winter months, you need never close your pool. If you know more than one way to say *snow*, you are probably considering not using your pool for a few months every year.

The Pool Guy recommends that you contract your local pool professionals and pay them to winterize your pool, especially to blow all of the water from all of the plumbing lines and to add the antifreeze. It's a specific pool antifreeze (usually blue) though in a pinch RV antifreeze can be used. It is not automotive antifreeze for the radiator.

You can save money by removing your own hand rails and ladders and by installing your own winter cover; it is not necessary to remove the diving board or the in-pool light. But, for the plumbing lines, it really is best to pay your



local pool professionals to make sure that the pool is properly winterized. If you do not get all of the water out of the plumbing lines and properly flush them with anti-freeze, the lines can (and probably will) crack, causing your pool to leak, resulting in a very expensive and very time-consuming service call. Yes, we have seen it and had to fix it.

If you do decide to winterize the pool yourself, let it be known that you are taking a major risk. Your pool, which consists of necessary plumbing, was a multi-thousand dollar investment. Please pay the money to have it professionally winterized. On the other hand, we can make good money fixing those things – this is not a cheap fix. We can reduce unemployment! OK, just call us in the Spring for a major repair job.

Final Chemical Additions

Before you have your pool winterized, you must have your chlorine (or its alternative), pH, Alkalinity, and Hardness levels in range. If they are in range, your water will look *a lot* better when you open the pool next season. If, however, these chemicals are neglected, your water will be outright filthy next season. About 1 week before you winterize, go visit your local pool professionals and have them test your chemicals on the computer. Then, listen to their advice. Spend the minimal amount of time and money to balance your chemicals. It is very important that ANY pool surface (concrete, gunite, shotcrete, vinyl-liner, or fiberglass) have balanced pool water while sitting idle all winter. Also, if you use an automatic chemical feeder, make sure the chemical (typically chlorine or bromine) is gone before winterizing.

Final Routine Maintenance

Leave your pool as clean as possible in autumn. Do a final vacuum before starting the winterizing process. The night before the final vacuum, brush the walls and floor. Allow the equipment to operate for at least 2 hours so that the recently brushed and currently suspended dirt and debris can be picked up by the main drain or skimmer(s) and go to the filter for permanent removal. Then, shut "off" the equipment overnight to allow any remaining dirt or debris to settle to the pool floor. The next morning, with the equipment still "off," clean out the pump and skimmer baskets. Net out any leaves or other large debris and then vacuum the pool (to filter). Once vacuumed, clean the filter, again. The cleaning will vary based on the type of filter that you use. You will need to keep netting until you are ready to put the winter cover on.

Draining the Pool

You will need to drain the pool to immediately below your lowest plumbing line, which is typically the return jets.

Fiberglass or Automatic Cover Pools: If you have a fiberglass pool or a pool with an automatic cover, it is best to only drain the pool to below the skimmer and elbows used to allow the majority of the water to remain in the pool.

To drain the pool:

- ✓ Turn the equipment "off."
- ✓ Move the skimmer valve(s) to the "closed" position so that ONLY the main drain valve is "open."
- ✓ Move the multi-port handle from "Filter" (or the current position) to "Waste" (or "Drain").
- ✓ Turn the equipment back "on."
- ✓ The water will drain through the waste-line.
- ✓ Stay close until finished. You do not want the pump to run too long. Too little water can be harmful by allowing freeze and thaw cycles to move things you don't want moved. Like this "pop-out." (See picture on the right.) If you replace water with fresh, remember that it needs to be brought up to the right chemistry.
- ✓ If you do not have a main drain, you will need to drain the pool with a submersible pump or create a siphon with your garden hose.

What to Do While the Pool is Draining

These are items you can take care of while the water level is draining:

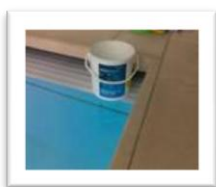
- ✓ If you have a heater, make sure you turn off the power source to the heater (natural gas, propane, or electricity).
- ✓ Remove your ladder(s).
- ✓ Remove your hand rail(s).
- ✓ Find your winter cover (and any accessories for the install) and remove it from storage.
- ✓ If you use a mesh safety cover, begin pulling up the anchors with your allen-wrench, or better yet, a (charged) cordless drill.
- ✓ If you use a water bag cover, begin filling the water bags (or hauling out the heavy sandbags). Remember that anything you use to hold down the cover could get swept into your pool during a VERY bad storm. Do not use anything that could harm, crack, slice, your pool surface.

Consider the consequences of actually trying to winterize your pool by yourself. The reason that we repeat this is because we fully believe that due to the liability that YOU will incur winterizing your own pool, you are better off paying your **TRAINED AND EXPERIENCED** local pool professionals to **PROPERLY** winterize your pool for you.

Immediately After the Pool Is Drained

Once the water level is approximately 3" - 5" below the lowest plumbing line (typically the return jets), take care of these items:

- ✓ Turn "off" the equipment in order to stop draining the pool.
- ✓ Remove the "eyeballs" from the return jets
- ✓ Remove the skimmer basket(s) from the skimmer(s).
- ✓ Add your winterizing chemicals:
 - 2 LBS of a strong chlorine-based shock treatment-Dichlor (granular chlorine) works best for a winterize. Since it is stabilized chlorine, the Dichlor will be more effective at preventing algae growth over the winter. You must dilute the Dichlor, 1 LB at a time. If you use warm water, the granules will dilute much faster. Use 3 LBS if your pool is over 35,000 gallons.
 - 1 quart of a super strength (Polymer) Algaecide. Many pool professionals sell a specially formulated Winterizing Algaecide.
 - 1 quart of a Metal Sequestering Agent is optional, but beneficial. It will help prevent any staining or the formation of scale.



Blowing Water Out Of the Plumbing Lines

Step #1: ***call your local pool professionals.*** If you still insist on actually doing this alone, proceed to the next step. But we highly... OK, we've said it enough times.

What you will need:

- ✓ Antifreeze (¼ gallon for each return line, plus 1 gallon for each skimmer)



- ✓ Skimmer gizzmo or plug and empty bottle(one for each skimmer)
- ✓ O-rings or Teflon Tape
- ✓ You will need at least a 4HP (Horse Power) Wet/Dry Vacuum (also known as a shop-vac) with both a VACUUM side and a BLOWER side. If you do not own one, you do not need to purchase one. Rather, contact your local pool professionals and pay them to winterize your pool. (Oops, said it again.)

If you do have the required 4HP blower, proceed - if we have not talked you out winterizing your pool yourself yet, *we will probably not be able to talk you out of it at this point.*

- ✓ Remove the drain plug(s) from the pump. Some pumps have more than one drain plug. This, of course, will allow water to drain from the pump.
- ✓ Remove the lid from the pump housing, the front part of the pump.
- ✓ Once the pump is empty, thread the pump drain plug(s) back in, temporarily.
- ✓ The main drain valve was probably already open, since you used it to drain your pool. Leave it open. Also, make sure your skimmer valve(s) are now open as well. Basically, you want all your valves OPEN.
- ✓ Walk over to the skimmer. With your 4HP Shop-vac (*using the vacuum side*), suck as much water as possible out of the skimmer. Place the hose in the opening at the bottom of the skimmer-this opening leads to the plumbing. Repeat this for every skimmer.
- ✓ You must now go over to the equipment and blow out each suction line (main drain and skimmers) one at a time. Make sure you are using the BLOWER side of the shop-vac (versus

the vacuum side). Since you are blowing out the *suction lines*, it does not matter what position the multi-port handle is located.

- ✓ Start with a skimmer. Close the main drain valve and any other skimmer valve. The only valve that you want open is for the skimmer that you will be blowing free of water. Turn on the blower and blow through the *pump housing-where the suction lines come into the pump*. You want to make sure the hose of the blower is inside the pump housing and pressed against the opening that leads to the suction lines. Blow the skimmer line until nothing more than a faint mist is blowing out from that skimmer. If there is more than one skimmer, repeat the process for each skimmer. Remember to close the valve for the skimmer you just completed and open the valve for the skimmer you are about to do next.
- ✓ Once the skimmer(s) are free of water, blow out the main drain. Remember to close the skimmer valve(s) so that only the main drain valve is open. Turn on the blower and blow out the main drain line. Again, put the hose of the blower inside the *pump housing* and blow out the main drain. It is very difficult to know when enough is enough since you are blowing out a line on the floor of your pool. Basically, blow the main drain line until tiny bubbles turn into a steady stream of bubbles. Once this steady stream of bubbles is apparent, blow the main drain for an additional 30 seconds. This is the best information we can provide. Your *trained and experienced* pool professionals can blow out the main drain line completely by feel, that is why they are professionals. *You must close the main drain valve while the blower is still blowing out the line*. This will help prevent water from back-flushing into the main drain line while you are closing the valve.
- ✓ You are now ready to blow out the return lines.
- ✓ Remove the drain plug/cap from the filter to allow the water to drain from the filter, again.
- ✓ Thread a winter plug in every return jet, *except for one*.
- ✓ Turn the multi-port to "RE-CIRCULATE."

- ✓ Turn on the blower and blow through the *discharge side of the pump-where the pump forces water back to the pool*. Blow the return line until nothing more than a faint mist is blowing out from that return jet. Once you have nothing more than the mist coming out of the return jet, thread a winter plug into that return, and unthread the winter plug from another return jet. Repeat the process for each return line until the water is blown out of all lines.
- ✓ Make sure either an O-ring or Teflon tape is on the thread of each winter plug.
- ✓ You are now ready to add anti-freeze to your return lines. One at a time, unthread the winter plug from a return jet. Place a funnel in the opening and add approximately 1/4 gallon of anti-freeze to each return line. Once added, immediately plug the return line and hand tighten the plug to prevent water from somehow entering the return line. Do this for every return jet.
- ✓ You are now ready to add anti-freeze to the skimmer(s). Add approximately 1/2 gallon of anti-freeze to the skimmer opening. Then thread a gizzmo (which you can purchase from any pool professional. Make sure you know the diameter of your skimmer opening; usually either 1 1/2" or 2") into the skimmer. Pour the remaining half of the anti-freeze into the skimmer for additional protection. If there is more than one skimmer, repeat the process of adding anti-freeze to each skimmer. Make sure either an O-ring or Teflon tape is on the threads of the gizzmo.
- ✓ You now have to winterize the pump/filter/heater equipment. To do so, move your multi-port handle to the "CLOSED" (or "Winterize") position.
- ✓ If you have a heater, remove any plugs from the heater. Also, disconnect the pressure switch. Turn the gas valve to the "off" position, if your heater is natural gas or propane. Isolate the heater and blow water through it to make sure that it is free of any standing water. Some heaters have a plug that is relatively hidden that should be removed to allow for any

residual water to drain out during the winter. Refer to your heater service manual to identify if this is the case with yours.

- ✓ If you have an automatic chemical feeder, remove any plugs from the automatic chemical feeder. Make sure any chemical (usually chlorine or bromine) is fully removed. Finally, isolate the automatic chemical feeder and blow water through it to make sure that it is free of any standing water. If your automatic chemical feeder is plastic, and can be removed from the plumbing system, it is a very good idea to move this indoors for the winter.
- ✓ Remove the plug(s) from the pump. You should already have the plug/cap removed from the filter, as the standing water needs some time to gravity drain from the filter. Go ahead and also remove the pressure gauge (as well as the sight glass and the air relief valve, if applicable).
- ✓ ***A good place to store all these miscellaneous parts is the pump basket within the pump housing.*** Keep the lid on all winter long to protect these parts. This is where your pool professional will look first when opening your pool in the spring.
- ✓ If you have completed all the items on this list, pat yourself on the back. If you decide it's a little more work than it's worth, put your local pool service professional on speed dial for next year.



Installing a Safety Cover

Safety covers are a great addition to any swimming pool maintenance program. They are just what the name implies, a safe option for secure winterization of your pool.

Here are the steps to installing a safety cover for the winter months:

- ✓ With your allen wrench, or better yet, a cordless drill, pull up the heads of all of the anchors.

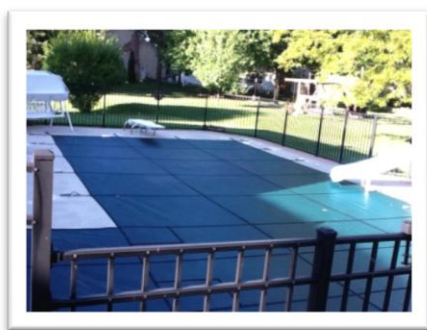
- ✓ Unfold the cover so that you can see how it will fit over the pool.
- ✓ Using your safety cover tool, install the springs to the anchors on one side of the pool:
 - If you have a rectangle pool, attach the springs to the anchors on a short side.
 - If you have any other shape of pool, attach the springs to the anchors on any strategic side in order to start.
- ✓ Walk the cover to the opposite side and, using your tool, attach the springs to these anchors.
- ✓ Then attach the remaining springs to the remaining anchors.
- ✓ Tighten the straps on any of the springs that have become loose. You want the cover to be stretched relatively tight during installation. The cover will dip with the snow load during the winter months, and even when this happens you want to ensure that nothing can fit in between the cover and the pool, causing any type of entrapment issue.

A safety cover is a valuable addition to your swimming pool. Installation is easier and safety is increased.

Installing a Plastic/Water Bag Cover

Here are the steps to installing a water bag cover:

- ✓ Fill all of your water bags **to about $\frac{3}{4}$** full of water. You need to leave a bit of space to allow for the expansion of freezing water.
- ✓ Unfold the cover so that you can see how it will fit over the pool.
- ✓ Place the water bags over the cover on one side of the pool:



- If you have a rectangle pool, place the water bags over the cover on a short side.
- If you have any other shape of pool, place the water bags over the cover on any strategic side in order to start.
- ✓ Walk the cover to the opposite side and anchor the cover with water bags on this opposite side, taking care not to allow the pool water over the top of the cover.
- ✓ Allow the excess cover to fit (droop) inside of the pool at water level, do not stretch it tight, as the cover needs to allow for seasonal rainwater and snow to settle on the cover. It's better to direct how this happens than to stretch the cover and wait to see what the seasonal load will do.
- ✓ Place water bags on top of the cover on the remaining sides of the pool. Fit them around the pool from end to end, not leaving any areas where wind could blow under the cover and displace it.
- ✓ We realize that this may sound simple and easy, however the actual installation of a water bag cover is not fun. It is heavy and awkward work and does not prevent someone or



something from falling into the pool water. To help you have a hassle free season, we recommend that you have a pool service professional measure your pool and provide you with a safety cover for the following season.

✓ If you would like to, once the cover is on the pool, you can run the garden hose and add approximately 1" – 1½" of water on the cover to keep the wind from blowing the cover off. Eventually rain and snow will weigh the cover down more.

Liability of Winterizing Your Own Pool

Most swimming pool service companies offer a guarantee for swimming pool equipment and lines that they winterize. If you close the pool yourself, you are taking on this liability as the homeowner.

A professional pool winterization is an investment rather than just a service call. All water has the potential to freeze, and if it is left in the plumbing or equipment, it can crack plastic and cause issues in the spring.

It is critical that 100% of the water is removed from the system and plumbing lines are flushed with antifreeze. You may want to ask yourself if you'd rather save the cost of a service professional closing your pool and risk the chance of thousands of dollars worth of damage

Are you tired of reading about potential pitfalls? Then make the call to your swimming pool service company and allow them to properly winterize your pool for you. Please.

Winterizing an Aboveground Pool

Most aboveground pool owners will contract and pay their local pool professionals to winterize their pool. If you decide to winterize your own aboveground pool, keep these tips in mind:

- ✓ Within a week before closing your pool, visit your local pool professionals with a pool water sample and have them test your chemical levels on the computer. You want to make sure that your chemical readings are ALL in a good range prior to closing your pool. If your chemicals are in range, it will be so much easier to re-attain good water chemistry next spring. If your chemicals are not in range, your water will probably be a mess the next spring when the pool is opened.
- ✓ Perform a final brush and vacuum of the pool.
- ✓ Clean the filter.
- ✓ Drain the water approximately 3" below your lowest plumbing line, which is typically the return jet.
- ✓ While the water is draining, remove your ladder (or the in-pool step that is now available with aboveground pools) and your skimmer basket.
- ✓ Once the water is below the lowest plumbing line, remove the drain plug(s) from the pump and the drain plug/cap from the filter.

- ✓ If you have an automatic chemical feeder, remove any plugs to drain the water.
- ✓ If you have a heater, disconnect the pressure switch and remove any plugs. Make sure that all of the water is removed to prevent freezing (and damage) of the equipment over the winter.
- ✓ Disconnect the hoses (very carefully and only after plugging the appropriate areas of your pool):
 - Skimmer to the suction side of the pump.
 - Discharge side of the pump to the filter.
 - Filter to the return jet.
- ✓ If you are capable of moving the pump and filter into a garage or storage shed, it really is a good idea. The pump is light and easy to carry. The filter is heavy. Either use a dolly and wheel the filter into storage or recruit a couple of friends to help you carry the filter into storage. (After all, they've been swimming in your pool all summer.) Again, this is not necessary, but it does really reduce the chance of freeze damage to your equipment.
- ✓ Add your winterizing chemicals:
- ✓ Liquid chlorine would be the best choice. It quickly dispersing throughout the pool and will do the best job at preventing algae growth while the pool is winterized.
- ✓ 1 gallon of a super strength Algaecide. Actually, many pool professionals sell a specially formulated Winterizing Algaecide.
- ✓ Many regions recommend adding a Metal Sequestering Agent and is a good idea for any region. A Metal Sequestering



Agent will help prevent staining on your pool walls and floor while the pool is winterized.

- ✓ Install your winter cover.

Maintenance

Care of your Pool's Interior

Just after a new gunite pool is put into operation, for the proper curing of the plaster finish, the pool needs to be brushed, vacuumed, and the water balanced daily for the first several weeks.

With any finish, your pool is clean, clear, blue, and sparkling you are ready for a routine maintenance schedule. This schedule must be followed in order to help achieve and maintain the right water chemistry and pool safety. Initially, pool maintenance may seem complicated and time-consuming. Once routine maintenance becomes an integrated part of your life as a pool owner, it will be very easy to maintain your pool and you will begin to develop an understanding of your personal pool needs. Think of it as an opportunity for a quiet Zen moment. Far less time and effort, as well as money, is needed to maintain a pool and prevent problems, than it is to rectify problems. (Did we give you the idea that this is important?!)

Care for Cleaning Equipment and Accessories

All cleaning equipment and accessories should be stored inside, out of the weather. You'll know where to find it, nobody will trip over it, it will work better, and last longer. The vacuum hose should not be dragged over the concrete, stepped on, or punctured with anything. When not in use, the hose should be drained, rolled up and stored in a safe place away from the sun. Don't overload your leaf skimmer and do not strike it on any object to dislodge leaves and debris.

Basic Maintenance Schedule

Due to varying bather loads from pool-to-pool and varying climates from region-to-region, no one can provide a universal maintenance schedule. Observe and recognize your personal pool needs. Budget your time, in order to follow a routine maintenance schedule that works best for you and your pool. While it is not absolutely mandatory to follow these procedures step-by-step, the following is a

well-recognized pool maintenance schedule, regardless of your region:

- ✓ Test water - but do not add chemicals until the maintenance schedule for that day is complete.
- ✓ Use your net(s) - remove all leaves and other large debris from the pool.
- ✓ Use your brush - remove dirt, or perhaps algae, stains, or scale from the pool walls and floor.
- ✓ Clean all baskets - skimmer(s) and the pump.
- ✓ Vacuum - remove any settled and remaining dirt, leaves, or other debris from the pool.
- ✓ Clean the filter –
 - if it is a sand filter or a DE filter, then backwash.
 - if it is a cartridge filter, then rinse the individual pleated filter elements with a garden hose and a pressurized nozzle (Note: too much pressure on the filter cartridge material may tear it).
- ✓ Add the necessary chemical(s) – based on the test(s) taken earlier that day.
- ✓ Shock regularly.

You will have to create your own maintenance schedule. Your bather load and your climate determine your maintenance routine and it will need adjustments. More in-depth explanations of the various maintenance tasks are in the next pages.



Daily Maintenance

Pool Water Chemistry

Proper pool chemical treatment is very important. Daily testing and chemical applications to the pool water for chlorine and pH is necessary for the first 30 days or until you feel familiar with your test kit and chemicals. Instructions for use are supplied with the test kit. A chlorine test must be done daily.

Good pool water chemistry can prevent scaling, etching, staining of the pool surfaces, and growth of troublesome algae that can lead to costly cleanups. Application of chemicals other than chlorine and pH chemicals are required and you should familiarize yourself with a local chemical supplier/pool store. They will test of your pool water and provide chemical application instructions. They usually require a 16 oz. water sample of your pool water and you need to know how many gallons of water are in your pool.

Weekly Maintenance

The pool surfaces should be brushed once a week, especially taking time to brush the water line. Vacuum the pool when it shows debris with vac hose and vac head or using an automatic pool cleaner.

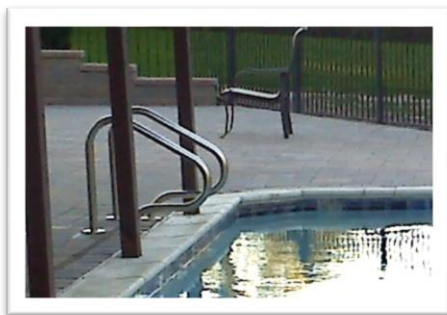
Monthly Maintenance

Deck Equipment - Pool Handrails & Ladders

Your deck equipment is generally constructed of stainless steel and requires monthly applications of metal cleaners and metal protectors. These may be purchased at your chemical supply house. See the section on Zinc anodes if you see signs of oxidation or pitting.

Pool Tile or Liner

Tile cleaning may be required monthly. Some relatively insoluble suntan lotions and body oils from swimmers may build up on the tile at the water level. Your pool chemical supplier will



have specially formulated product that will quickly clean the tile without effecting pool water chemistry.

Pool Water Chemistry

A sample of your pool water should be tested by your chemical supplier and the pool chemistry adjusted with the required chemicals.

Miscellaneous Maintenance

Aside from your routine maintenance schedule, you should also perform these tasks periodically:

Lubricating O-Rings

It is a good idea to purchase an O-ring lubricant from your local pool professionals. As you clean the pump basket or prime the pump, lubricate the O-ring on the pump lid from time-to-time. O-rings allow equipment and fittings to properly seal, eliminating the possibility of air or water leaks. *Do not* use Petroleum Jelly – it's bad for rubber and will ruin your O-ring.



Regular Use Of The Heater

Heater problems may be prevented just by using the heater. If the heater is left unused, spider webs (and other insects), nesting (of rodents), dirt, and rust may appear. Therefore, the only periodic maintenance for your heater is simply to use it. The pool guy recommends that you consult your local pool professionals to perform any actual service that may be needed on your heater.



Brush Off/Hose Off Your Pool Deck

It is a good idea to brush off your pool deck from time-to-time. Especially when you have your garden hose out to either prime the pump or add water to the pool, due to evaporation, it is a good idea to hose off the pool deck. This keeps rocks, gravel, other sediment, dirt, leaves, grass clippings, lawn fertilizers, and other debris in your yard and out of your pool.

This stuff will:

- ✓ Absorb your chemicals, rendering them less effective in the pool.
- ✓ Fall to the pool floor, causing additional and unnecessary vacuums.
- ✓ Fill your skimmer and pump baskets.
- ✓ Perhaps, maneuver through your skimmer basket and then the pump basket, and clog the pump, resulting in a service call to your local pool professionals.

Winter Months (Southern climates only)

It is important that you keep your chemicals balanced and the pool clean during the winter months to avoid stains and costly repairs later.

In freezing weather, when the pool equipment is circulating freely, the pool is clean, and the equipment is running smoothly, it is normally understood that there is no danger of freezing. However, it is known that a system has frozen up for no apparent reason. If you are concerned with freezing temperatures, turn your heater on and maintain pool water temperature above freezing, as needed.

Instructions for winter operation:

- ✓ Keep baskets clean.
- ✓ Keep filter backwashed.
- ✓ Maintain pool chemistry.
- ✓ Drain all auxiliary pumps not continuously circulating by unscrewing the drain plug.
- ✓ In case of electrical failure, drain the filter and pump by unscrewing the drain plugs. This makes sure that there is no water that can freeze and cause damage to your equipment.

More Specifics

Using Pool Nets

There are two styles of standard pool nets:



The deep leaf net (also called a leaf rake – not to be confused or substituted with a garden rake) has a wide opening and a deep net. This style of net is primarily used to reach leaves or large debris that has settled to the pool floor. The deep leaf net can also be used to skim leaves and debris off the surface of the water, but the skimmer net is best at performing this task.

The skimmer net has a shallow net and is primarily used to remove leaves, grass clippings, debris, or insects that float on the surface of the water.

Regardless of the net used, leaves and debris must be removed from the pool for a number of reasons. A collection of leaves and debris on the pool floor can clog the main drain, which will restrict water circulation and filtration. They can also clog the skimmer basket(s), which will restrict water circulation. They will absorb chlorine (or its alternative), rendering it less effective to keep up with the bacteria, living organisms, ammonia, and other contaminants that are constantly present in pool water. This could include algae spores, which can lead to an outbreak of algae. Of course, they can also clog vacuum equipment. It is best to net out as much of the larger leaves and debris as possible, and then vacuum up the rest.



Netting literally takes 10 - 15 minutes. Do it anytime a significant amount of leaves or other debris is present in the pool; after any windstorm and daily during autumn, and perhaps even multiple times per day on windy autumn day if you have a lot of trees around.

Skimmer Basket(s)


At times, the pressure gauge on your filter will show the operating pressure to be low, which means circulation is poor. The first area to check is to make sure the water level in the pool is adequate. If not, fill the pool to the standard operating level (covering $\frac{1}{2}$ to $\frac{3}{4}$ of the skimmer opening). If the water level is adequate, check and clean the skimmer basket(s). Some pools have only one skimmer, while many pools have at least two skimmers.



- ✓ Remove lid from the skimmer. This lid should be on your pool deck. If there is no lid to access the skimmer basket from the top, simply kneel down, stabilize yourself on the deck, and remove the skimmer basket from the skimmer opening inside the pool. If you cannot access the skimmer basket from your pool deck and have to get it from the skimmer opening inside the pool. Be careful not to fall into the pool, unless you are in the mood.
- ✓ Remove the basket from the skimmer.
- ✓ Empty out all the contents.
- ✓ Clean the basket with a strong spray from a garden hose.
- ✓ Put the basket back in the skimmer and close the lid.

Notes:

- ✓ If there is more than one skimmer, repeat the process for all skimmers.

- ✓ If skimmer basket(s) are extremely full, it is a good idea to shut "off" the equipment TEMPORARILY in order for you to remove the basket(s) from the skimmer(s) without damaging them. This is especially true in autumn, when leaves are falling into your pool. This way there is no chance that leaves or debris can enter the plumbing where they could clog the plumbing. Once all baskets are cleaned and put back in place, make sure to turn the skimmer valves back to the "open" position.
- 
- ✓ For aboveground pools:
 - remove the lid to the skimmer box that is mounted on the outside of the pool wall. Once removed, you will have easy access to the skimmer basket.
 - put a plug (either threaded or expandable) or a tennis ball in the plumbing outlet on the bottom of the skimmer, while cleaning the basket.
 - ✓ **From Wikipedia:** Entomology ... the scientific study of insects, a branch of arthropodology, which in turn is a branch of biology. At some 1.3 million described species, insects account for more than two-thirds of all known organisms,[2] date back some 400 million years, and have many kinds of interactions with humans and other forms of life on earth... Find someone interested in this subject and you may get some free cleaning! Tell them that they can have all they want and more (see next section.)

Cleaning The Pump Basket

Your pump basket sits in the front of the pump housing. Skimmer baskets trap leaves and other debris so that they do not enter the plumbing, yet some debris (small bugs, dog hair, pine needles, etc.) will escape the skimmer basket(s) and get into the plumbing. It's the job of the pump basket to trap this before it enters the equipment, where real damage can occur. As in this photo, the pump basket is usually positioned under a clear lid. This makes it easy to monitor

the pump basket daily and clean it out whenever needed. Here are the steps:

- ✓ Turn "off" the power to the equipment.
- ✓ Turn the valves (main drain and skimmers) to the "closed" position.
- ✓ Turn off return valve (only if equipment is lower level than pool).
- ✓ Remove the lid from the pump housing-the front part of the pump.
- ✓ Note how the basket fits into the pump (so that you can put it back in the same way) and remove it.
- ✓ Empty out any bugs and stuff.
- ✓ Spray the basket with a garden hose & nozzle.
- ✓ Put the basket back in the pump.
- ✓ Check the O-ring on the pump lid to make sure that it is in good shape and in place. (About once a month, check if you need to lubricate the O-ring. Lubrication helps to seal the lid (to prevent air from getting into the pump) and it will add to the life of your O-ring. *Be sure to use a water based lubricant designed for this purpose.*)
- ✓ Put the pump lid back on the pump and lock it in place.
- ✓ Open the return valve (only if equipment is lower level than pool).
- ✓ Turn the valve for ONLY the main drain back to the "open" position. Note: Most aboveground pools do not use any valves.
- ✓ Turn the equipment "on". The entire process should take you about a minute.



- ✓ When the pump starts and you can hear/see the water flow, open the skimmer valve(s). Open each skimmer valve one at a time, and slowly to alleviate all the air. If there is more than one skimmer, open each one slowly.
- ✓ Check filter gauge to see that pressure is up to normal (may take a few minutes).

If pump does not start moving water after 1 to 2 minutes, you may need to prime the pump. (See the “Pump” section for more information.)

Brushing

Pool Brushes are typically 18" long and have either durable nylon bristles (to be used on any type of pool) or stainless steel bristles for concrete, gunite, shotcrete, or fiberglass pools.

Brushing is an extremely important, but often overlooked, task for maintaining your pool. Brushing removes microscopic matter from the pool walls and floor and suspends this matter in the water. Now it can be killed by chlorine (or its alternative) and get filtered out of the pool.

NOTE: If the microscopic matter is too small and remains in the pool, you will need to add a Clarifier to coagulate these small particles into larger particles, where they will indeed be killed by chlorine (or its alternative) and trapped by the filter.

Always brush the pool from the walls to the floor, using a top to bottom brush technique. Start at the shallow end and brush towards the deep end. Brushing takes about 10 - 15 minutes, and should be done at least twice per week. You may need to do it more often if landscaping or construction is underway near your pool.

If possible, brush on the day before vacuuming the pool. Run the pump for a couple hours after brushing, so that the main drain and skimmer(s) can remove much of the recently brushed dirt and debris from the pool. Shut "off" the equipment overnight or for a few hours to allow any remaining dirt and debris to settle to the bottom. Restart the equipment and vacuum the pool. Afterwards, check the pressure gauge. If it is 8-10 psi above the standard operating

pressure, clean the filter. (See the “Vacuum” section for more information.)

Brushing is one of the easiest items of the maintenance schedule. However, neglect can lead to favorable conditions for an outbreak of algae. ☹ Then brushing will need to be done daily, and perhaps multiple times per day, and it will be time-consuming and labor-intensive. ☹ Therefore, makes sure brushing is part of your routine maintenance schedule. 😊

An alternative is to get an automatic pool cleaner that will also brush your walls. Or hire a pool service?

Vacuuming

Some of this process is covered in the “Brushing” section because vacuuming usually comes after brushing, just like in this book and the dictionary.

Vacuuming "On Filter"



head for your pool, either a vinyl liner vac head or a gunite vac head.

When doing your regular vacuuming, set the multi-port valve to the “filter” position. This will vacuum the dirt and debris to the filter where it will be trapped and permanently removed from the pool. Only clean water will return to the pool. Make sure you are using the appropriate type of vac



Here are the steps:

- ✓ The night before you vacuum, brush the pool walls and floor. You need to allow the equipment to be operational for at least 2 hours to allow the main drain and skimmer(s) to remove the recently brushed and currently suspended dirt and debris. Then, turn

"off" the equipment overnight to allow any remaining dirt and debris to settle to the pool floor.

- ✓ In the morning, make sure that the water level in the pool is $\frac{1}{2}$ to $\frac{3}{4}$ up the height of the skimmer opening. Add water if you need to but try not to churn up the dirt that has settled to the bottom.
- ✓ Make sure the multi-port is on the "filter" position.
- ✓ Turn the equipment back "on."
- ✓ Isolate the suction to the skimmer (or vacuum line) to get the best suction. If you use a skimmer, close the valve for the main drain and the valve(s) for any other skimmer(s) that you will not be using for the vacuum. Of course, if you use a designated vacuum line, close the valves for the main drain and all skimmers.



- ✓ Install a vacpole to your vac head.
- ✓ Install one end of the vacuum hose to the vac head.
- ✓ Allow the vac head (*with one end of the vacuum hose and the vacpole attached*) to sink to the bottom of the pool in the deep end.
- ✓ Where the vacuum hose now meets the surface of the water, push the remaining vacuum hose from your deck down into the water. Keep it towards the wall. Only leave the very end, that will attach to your skimmer (or designated vacuum line), out of the water. This fills the hose with water. The goal is to have as little air as possible in the hose. Be careful not to fall into the pool or you will stir up all that nicely settled debris and also get quite wet.
- ✓ Once completely filled with water, quickly install the end of the vacuum hose into the skimmer (or designated suction line) that you will vacuum from. If you use your skimmer, you may have a vacuum seal plate to help hold in the suction.



- ✓ With the vacpole, maneuver the vac head across the pool floor. If the suction is too strong and the vacuum gets stuck to the bottom, open up the main drain valve a little.
- ✓ As you vacuum the pool, dirt and debris will get trapped in the filter. This, of course, will cause the pressure to rise within your equipment. Monitor the pressure gauge. If the pressure is 8-10 psi above the standard operating pressure, then clean the filter, regardless if you are still vacuuming or if you are complete.
- ✓ Vacuum slowly. You do not want to stir up the dirt and debris from the floor, where you can get to it.

NOTE: Some people, even pool professionals, will advise you to hold the end of the vacuum hose in front of a return jet in order to prime the hose (eliminate air and fill with water). This is a good idea in theory. But, if dirt and debris is light, the water going from the return jet, through the vacuum hose, and out of the vac head... could stir up this dirt and debris on the floor, clouding up the water, impairing visibility to effectively perform the vacuum. After all, the objective when vacuuming is to have the dirt and debris settled on the floor-not stirred up and suspended in the water.



Vacuuming "To Waste"

Sometimes dirt and debris are thick and heavy. If so, do not vacuum with your multi-port on "filter." Pressure will build up so quickly that you will spend more time cleaning the filter than vacuuming. Bypass the filter and vacuum on "waste" (or "drain"). *Remember to turn the equipment "off" when moving the multi-port from one setting to another.* Do not spend a lot of time vacuuming to "waste" since you will be sending the water to a waste-line and lowering your pool's water level. You may want to run your garden hose to the pool to help compensate for water that is lost through the waste-line during the vacuum. If you use a designated vacuum line, put the garden hose anywhere. Otherwise, position it so that it will not churn up the dirt on the floor of the pool.

IMPORTANT: NEVER, ever, let the water level drop to or below the skimmer (or designated vacuum line) while your pump is running. Air will get into the system which may cause you to lose prime *or worse*. It could cause your motor to overheat, become prematurely defective, and require a replacement, which is *expensive*.

Vacuumping An Aboveground Pool

This is very similar to the in-ground pool process.

You can vacuum your aboveground pool "to waste" by filling up the water level to the highest point of the pool (almost to the point that the pool will overflow.) Connect your backwash hose to the appropriate plumbing outlet on the equipment to create a manual waste-line. Making sure that the power to your equipment is "OFF" before moving the multi-port handle, move the handle to the "Waste" (or "Drain") position. A running garden hose, over the pool wall, can compensate for some of the water loss. Only vacuum "to waste" until the water level is just above the bottom of the skimmer opening inside the pool. You do not want to pump air for long and ruin your motor.

Pump, Motor, Heater & Filter

Pool Pump & Motor

The swimming pool pump & motor is commonly referred to as “the pool pump.” It’s one of the most important parts of your swimming pool and the only way to keep water clean. Without proper circulation and filtration you would soon have one giant biology experiment in your back yard. A successful pump will run at an optimal level and you’ll experience fewer problems, easier maintenance, lower utilities costs, and longer equipment life.

Dirt should never be allowed to enter the motor, do not sweep around a running motor. Motor fans will suck dust and dirt into the motor which could damage it. Leaves, paper, airborne lint and other foreign objects can clog the screened air passages. For the same reason, avoid storing or spilling dry chemicals or powdery materials near the motor.

Most pool motors are drip proof motors, designed to withstand the hazards of rain, mist, and fog. They are not made to work or be stored in water. Avoid the “pad” (where your pump and filter are located) when hosing down floors, deck, etc or when watering lawns and plants. Even just “hosing the motor down” can result in water being sucked in by the fan and into the unit, shortening the life of the motor.

Do not wrap the motor with airtight materials, such as plastic. The air needs to move.

In case of electrical failure, during freezing weather, the filter system, pump and heater must be drained or they will freeze and burst.

Sizing Your Swimming Pool Pump

You will need the following information:

- ✓ Pool Volume
- ✓ Capacity
- ✓ Flow rate
- ✓ Total Dynamic Head

These four factors are the basis for sizing the correct pool pump. Keep in mind that the pump works in conjunction with your filter, heater, plumbing lines, skimmer, drain, and returns. All of these elements need to be considered so that your pump is proper for your water turnover, and that it is also going to work well with all of your other components.

The industry standard efficiency for a swimming pool pump and motor is the capacity to circulate the entire volume of pool water in 8-10 hours.

How Swimming Pool Pumps Work

First, water is drawn from the pool through a hose called the *influent line*. The influent line leads into the pump where water is usually passed through a strainer basket and on to the *impeller*. The impeller, a rotating piece of the pump that is attached to the electric motor shaft, creates centrifugal force by spinning. Centrifugal force, meaning the outward movement of the water caused by the impellers rotation, is what forces water out through the hose leading to the next piece of equipment (usually the pool filter). This hose is called the *effluent line*.

Heater

The best way to keep it in good working order is to use it.

To light the Pilot:

- ✓ Turn off switch for heater thermostat.
- ✓ Turn main gas valve inside heater to off position. Leave in off position for two (2) minutes.
- ✓ Turn main gas valve to pilot position and depress the valve and hold down.
- ✓ Light the pilot. You can locate the pilot by following the small tube that runs from



the main gas valve to where the heaters burners are located. At the end of this tube is the pilot head. When the pilot lights, continue to hold the main gas valve down for one (1) minute.

- ✓ Switch the main gas valve to on position.
- ✓ Switch on thermostat and turn up heat.

There is a considerable amount of condensation that drips from the heater when the pool water temperature is below 75° F. This is normal. The pool heaters thermostat has an accuracy of $\pm 4^\circ$ F. maximum temperature is normally preset at 102° F. A comfortable swim temperature is about 88° F. If you are doing a lot of exercise, you might want it a bit cooler.

If the Heater quits working

- ✓ Check the pilot to see if it is on. Wind or breeze may blow pilot out.
- ✓ Check the gas valve, make sure it is on and gas pressure is available.

Filter Systems

The main purpose of the swimming pool filter system is to keep your pool water clear and clean. All pool filters are manufactured for the removal of airborne dirt and leaves, organic matter introduced by bathers, and other organisms such as bacteria and algae. This mechanical entrapping is achieved through different techniques, which lead us to the 3 main types of swimming pool filters: cartridge pool filters, diatomaceous earth pool filters, and sand pool filters.

Maximizing Swimming Pool Filter's Potential



Whatever style of pool filter you choose you will want to set up your filtration system with these two objectives in mind:

- ✓ First, maximize the filtration area. The larger the filter area, the less often you will need to clean the filter, which means more time spent enjoying, not maintaining, your swimming pool. Maximized filtration area means the proper size, rather than the minimum required size for your swimming pool's capacity.
- ✓ Second, design a system that requires the least amount of pumping power to achieve a needed flow rate. Lower pumping power means lower utility costs.



Pumping power, to achieve the needed flow rate, has everything to do with the recommended flow rate of the pool filter you purchase and the size of your pools plumbing.

Multi-port Valves

Multi-port valves are also called filter control valves, backwash valve, Vari-Flo valve, or even just “the multi-port.” They are near the pump and filter. The multi-port itself does not have a power source.

Water flows into the pump from the main drain and skimmers. It is then pumped up and into the multi-port valve. The valve is used to select filter, backwash, rinse, winterize, drain/waste, and re-circulate/whirlpool (these labels vary, based on



manufacturer). The job of the multi-port is simply to tell your water where you want it to go.

You might have a top-mounted multi-port valve, meaning it's located on the top of your filter. Or you may have a side-mounted system, meaning the multi-port is located on the side of your filter. Obvious, right?

Some swimming pool systems have a push/pull valve instead of a multi-port (if you have one of these, we have many reasons you may want to consider having a multi-port plumbed (built) in – those few of you, call us, we can chat about this.)

IMPORTANT: Always turn your system off, if you are going to move the handle on the multi-port valve. If you move the handle while the system is running, you can blow the spider gasket, which is on the inside, out of place with the force of the water in the system. So don't do that. Okay?

The picture on the right has a Side Mount Multi Port Valve.



The picture below has a Top Mount Multi Port Valve.

Identify the different functions and settings that are on your multi-port valve. One, you will now know what your multi-port valve can do and, two one of these settings will be a...

Filter Setting

This pulls in water from the pool, filters it, and then sends it back into the pool.

Backwash

This is used to flush out the filter by pushing the particles that are clogging up



the filter, out through the waste hose. The backwash setting reverses the flow of the water. Instead of going in through the top of the filter and down through the sand, the water goes in through the bottom, pushing the water up through the sand, lifting debris off the top and pushing them out the waste hose.

Rinse

The rinse function reverses the flow back to normal filter flow, with one exception, it continues to put the water through the waste hose to clean out any leftover debris in your pipes. If you turn the water back on to filter, and your pool returns are showing a fine mist of dust /dirt/debris back into the pool either you didn't backwash long enough, you didn't rinse long enough, or something is broken.

If the filter becomes very clogged, may be necessary to rotate between the rinse and backwash settings on the multi-port valve, until the water runs clean.

Waste

Some multi-port valves also come with a waste setting. This setting takes the water directly to the drain, instead of putting it through the filter and back out into the pool. This can be much more convenient for pool owners. (See the section on vacuuming for more information.)

IMPORTANT: We've said it before and we'll write it again... NEVER, ever, let the water level drop to or below the skimmer (or designated vacuum line) with the motor running, set to pull water from your skimmers. Air will get into the system which may cause you to lose prime *or worse*. It could cause your motor to overheat, become prematurely defective, and require a replacement, calling for help, which is *expensive*.

Re-Circulate

The re-circulate setting on your multi-port valve will take the water in through the pump, put it through the multi-port valve, bypass the filter, and put the water into the heater/return jets to the pool. This is a setting that can be used to troubleshoot filter issues, and help your pump gain prime more quickly than it sometimes will if you have recently opened your system to introduce air into the lines.

Multi-port Valve Parts and Maintenance

Maintaining and taking care of your pool's multi-port valve is not only simple, but also necessary to ensure that your pool continues to operate and function in the manner that you need it to.

The handle on your multi-port valve should move freely when pushed – **NEVER** try to move the handle while your system is running. The water pressure running through your system is very strong. If you attempt to move the multi-port handle while the water is running, it can break things within the multi-port and cause multiple problems. One of the most common issues concerns your spider gasket. It seals the top and bottom of the multi-port together and can be pushed out of position, causing malfunctions in your valve. If the gasket is out of position, it can misdirect water into more than one place at a time. The multi-port can typically be taken apart to assess the condition of the inner parts. When it looks like it should be replaced, make sure you do. It's a relatively inexpensive part, and plays a large role in your equipment.

The multi-port should not make noise. If you are trying to troubleshoot a noise, unless it is an air leak, or a misdirection of water, the noise is most likely coming from somewhere else.

The multi-port valve commonly has a plug, a pressure gauge (unless you have a system where the pressure gauge is mounted to the filter) and a sight glass. These parts are taken off for proper winterization and reinstalled during your opening. If you experience a water leak from any of these areas, you may want to take out the part, put some magic lube (water based lubricant) or Teflon tape on the threads to prevent leaking. A drip every once in a while is okay. A stream is something that should be looked at.

If your handle or any part of your multi-port malfunctions, please call your pool professional.

The Pressure Gauge

The pressure gauge will tell you a lot about the current status of your equipment:

- ✓ If the pressure on your Pressure Gauge is DECREASING, you have an obstruction, which is typically a full skimmer and/or pump baskets. If cleaning all the baskets does not resolve the problem, there may be an obstruction in the plumbing, for this, it is best to call your local pool professional.
- ✓ If the pressure on your Pressure Gauge is INCREASING, you have a dirty filter. Once the pressure rises 8-10 psi above your standard operating pressure, clean your filter.
 - If you have a Sand filter or DE filter = backwash.
 - If you have a Cartridge filter = clean the pleated filter elements with a garden hose and pressurized nozzle.

Sand Filter

Sand Swimming Pool Filters

Sand pool filters are one of the most popular ways to filter water. They are simple, effective, and require just a bit of maintenance. This is also the Pool Guy's first choice for most Michigan pools, and for high iron content areas. Pool water is routed through a sand-filled pressure vessel. Over time, dirt accumulates in the spaces between the sand particles, causing the pressure in the vessel to rise as water finds it harder to pass through. This signals you to "backwash" the filter, which you do by reversing the water flow and cleaning out the dirt. Sand Filters can filter out particles as small as 20 microns.



Backwashing - Cleaning A Sand Filter

If you have a sand filter, it will need to be backwashed when the pressure is 5-7 psi above the standard operating pressure.

Here are the steps:

- ✓ Turn "off" the equipment.
- ✓ Move the multi-port handle from "filter" to "backwash".

- ✓ Turn "on" the equipment.
- ✓ Allow the equipment to backwash for 2 - 3 minutes. If your filter is equipped with a sight glass, backwash until the water in the sight glass turns from dirty to clean. When you backwash, you will sacrifice some of your pool water-chlorinated (or its alternative) pool water. Monitor the level of your chlorine (or its alternative) after a backwash. Also, monitor the water level. If it gets low, add water until the water level is at least half way up the skimmer.
- ✓ After backwashing, turn "off" the equipment.
- ✓ Move the multi-port handle from "backwash" to "rinse."
- ✓ Turn "on" the equipment.
- ✓ Rinse the sand for 20 - 30 seconds to assure that all dirt and debris has been eliminated from the multi-port valve and plumbing.
- ✓ Turn "off" the equipment.
- ✓ Move the multi-port handle from "rinse" back to "filter."
- ✓ Turn "on" the equipment and operate as normal.

Notes:

Sand should be professionally replaced every 3-5 years. After these 3-5 years, once filter cycles decrease (when it is taking less time for the pressure gauge to show a rise of 5-7 psi) and the need for backwashing increases, contact your local pool professionals and pay them to change the sand. There are fragile laterals at the bottom of the inside of your sand filter. If even one of these laterals is cracked or broken, sand will enter the pool, resulting in additional service-and additional fees. Therefore, have the sand professionally replaced.

You can prolong a filter sand change by adding a specially formulated Sand Filter Cleaner during the 3rd or 4th year. Do read the instructions on the label before adding any chemical/cleaner.

Poor water chemistry, as well as insufficient cleaning of the filter, can lead to problems with the sand. *Cake like debris* may form due to poor water chemistry, particularly a high pH. If your water is high in pH, it will not be able to keep calcium in solution. This calcium will

find its way into the filter. It can attach to the sand and combine with hair, lint, and other debris (due to a poorly cleaned filter) and form the cakes, resulting in a blockage in the filter. This can lead to calcification of the sand and/or channeling. Channeling is when a trail (or trails) are created through the sand. During filtration, water will pass through the filter, but bypass getting filtered by the sand as it rushes through the channel(s) and back into your pool. The solution: monitor your water chemistry and clean your filter.

Diatomaceous Earth (D.E.) Pool Filters

Filtering with a diatomaceous earth (D.E.) pool filter results not just in clean water, but water that really sparkles. That's because DE pool filters remove particles as small as 3–5 microns. Even though particles smaller than 40 microns can't be seen with the naked eye, large quantities of these microscopic contaminants have a very noticeable effect on water clarity and a DE pool filter strips them away.

Backwashing & Bumping - A DE Filter

If you have a DE filter, it will need to be backwashed when the pressure is 8-10 psi above the standard operating pressure. The main drawback of backwashing a DE filter is, as the dirt and debris are removed from the filter, so is the DE powder. This requires adding new DE powder after each backwash. New style DE filters, called Regenerative DE filters, have implemented a "bump" mode in order to prolong the filter cycles and reduce the need to backwash. But, after so many "bumps," backwashing is inevitable.

- ✓ Turn "off" the equipment and move the multi-port handle from "filter" to "backwash."
- ✓ Turn "on" the equipment and allow the system to backwash for 2-3 minutes. If your filter is equipped with a sight glass, backwash until the water in the sight glass turns from



dirty to clean. When you backwash, you will sacrifice some of your carefully chemically balanced pool water.

- ✓ Turn "off" the equipment and move the multi-port handle from "backwash" to "rinse."
- ✓ Turn "on" the equipment and rinse the new layer of DE powder for about 10 seconds to assure that all dirt and debris have been removed from this new DE powder.
- ✓ Turn "off" the equipment and move the multi-port handle from "rinse" to "filter."
- ✓ Turn "on" the equipment and add new DE powder.
 - Mix DE powder in a bucket of water, following the manufacturer's directions.
 - Pour the DE powder/water mixture into a skimmer. The mixture will enter the DE filter and disperse evenly to create a fresh layer of DE powder on the DE grids. The DE powder forms what is called a *filter cake* on the grids. (DE Filter – cake is good. Sand Filter – cake is bad. Mom's cake is the best!)
- ✓ Check your pool water chemistry and your water level after a backwash. The water level needs to be at least half way up the skimmer and can be taken care of right away. Then you can do the chemistry check.

NOTES:

- ✓ Too much DE powder can cause the *filter cake* to be too thick. The grids will compress against each other, causing an adhesive of the dirty DE powder to the grids. If this occurs, you would be wise to contract and pay your local pool professionals to scrape the dirty DE powder off the grids; care must be taken so that the grids are not torn.
- ✓ On the other hand, too little DE powder can cause dirt and debris to get imbedded on the grids, which will ruin the grids.

Bumping

New style DE filters, called Regenerative DE filters, require less backwashing, as they can be "bumped" to readjust DE powder, which prolongs the filter cycle.

- ✓ When the pressure is 8-10 psi above the standard operating pressure, close all the valves (main drain and skimmers) and turn the equipment "off" for at least 2-3 minutes.
- ✓ Most Regenerative DE filters have a "bumping handle." By slowly pulling down and rigorously pushing up on the handle 5 to 10 times, DE powder will fall to the bottom of the filter.
- ✓ When 5-10 bumps are completed and 2-3 minutes have elapsed, open all of the valves and turn the equipment back "on." A fresh layer of DE powder will instantly form on the DE grids inside your DE filter.
- ✓ If your Regenerative DE filter is not equipped with a "bump handle," simply hit the actual filter tank/body with a *rubber* hammer 5 to 10 times.

Check the DE grids inside your DE filter periodically. Cleaning the grids is required periodically because (body or suntan) oils, scale, and other deposits can build up on the grids. Many pool professionals sell a specially formulated Filter Cleaner for DE grids. If the grids are torn or frayed, you will need new DE grids, which is a good job for a professional.

Cartridge Swimming Pool Filters

This is the top-end filter performance with the lowest maintenance. A long proven design uses special filter elements to strip particles from pool water with great effectiveness... particles as small as 25-100 microns (particles smaller than 40 microns cannot be seen by the human eye). Cartridge filter maintenance is easy. It may not be best in areas with high iron in the source water.



Cleaning A Cartridge Filter

If you have a cartridge filter, the individual pleated filter elements will need to be removed from the filter, cleaned with a garden hose and pressurized nozzle, with a pressure of 8 to 10 psi above the standard operating pressure, and secured back in the filter. There is no backwashing with a cartridge filter.

- ✓ Turn "off" the equipment and then remove the lid to the filter tank.
 - Many Cartridge filters have a band that holds the lid of the filter to the base of the filter.
 - If your cartridge filter uses a different application, or if you have difficulty removing the lid for any reason, consult your local pool professionals for advice.

- ✓ Remove the pleated filter element(s) from the filter. Some cartridge filters use only one large pleated filter element, while other cartridge filters use a series of smaller pleated filter elements.



- ✓ Spray each pleated filter element with a garden hose and pressurized nozzle. Take time to spray between each pleat. This is where the dirt is.

- ✓ Put the filter element(s) back in the filter.

- ✓ Put the lid back on the filter tank and secure the lid.
 - Make sure the large O-ring is in place and is in good working shape.
 - About once per month, or whenever needed, put an O-ring lubricant on the O-ring. This will create a nice, tight seal, eliminating any air from entering the filter and extend the life of your O-ring. If the O-ring

is torn or frayed, or in any way unusable, then purchase a new O-ring from your pool supplier.

- ✓ Turn "on" the equipment and operate as normal.

Notes:

The individual pleated filter element(s) should be replaced yearly. A benefit of cartridge filters is their filtering capabilities and the ease in which they are cleaned. A drawback of cartridge filters is the expense of replacing pleated filter elements each year.

If the pleated filter elements are still in relatively good shape, you can keep them as a backup while your main pleated filter element(s) are being cleaned. You can prolong the life of pleated filter elements by soaking them overnight in a specially formulated Cartridge Cleaner every 3-4 months. You will, however, need backup pleated filter elements to install in your filter while your main pleated filter elements are soaking overnight. Do read the instructions on the label before placing your pleated filter elements in a (5-gallon) bucket with a mixture of the Cartridge Cleaner and water.

If pleated filter elements are torn or if the base is cracked, new pleated filter elements will need to be purchased, even if they are less than 1 year old. So, watch that hose pressure.

Operations – Running Your System

Chemicals work in conjunction with water circulation and filtration. Even with a vast and superior understanding of water chemistry, pool water can, and often will, suffer if water circulation is too limited or if filtration is poor. Therefore, allow the equipment to operate for the recommended amount of time.

There are several discussions about what is the proper amount of time to run swimming pool filtration equipment. Many pool professionals recommend that the



equipment is run continuously-24 hours per day and 7 days per week. In some cases you may find that the equipment only needs to be run 8-10 hours per day (which is the absolute minimum recommended.) With the new variable speed pump options the investment in the pump can be offset by the energy savings to the consumer, resulting in more efficient operation of the pool 24 hours a day.

Reasons for 24/7 operation:

- ✓ Chemicals rely on circulation and filtration. If water is stagnant, filtration will be by-passed, and water chemistry will suffer.
- ✓ If water chemistry is lost, it will cost a lot of money to purchase the additional chemicals that will be required to re-attain water chemistry. Once water chemistry is lost, it will take 2-3 times the amount of chemicals to re-attain water chemistry than it would have to simply maintain water chemistry.
- ✓ The skimmer can't skim surface debris if the system is not running.
- ✓ Chlorine generating salt systems are only producing chlorine when the system is running. In some large pools, the system will need to be run 24/7 to allow for the production of adequate amounts of chlorine.

Reasons for 8-10 hours/per day operation:

- ✓ Save on electricity. Well, maybe. There are new multi-speed pumps on the market that use less electricity running on low for 24/7 than at a higher rate for a few hours.
- ✓ Pumps and filters are properly sized by the pool professionals. The equipment that is installed on each pool is done so on a case-by-case basis. Usually, on a regular setting, the pump will send the entire volume of the pool water through the filter within 8-10 hours.

If you are having any problems with maintaining water clarity, allow the equipment to operate more hours per day. If you are in a period of hot temperatures, unbearable humidity, and intense sunlight, operate the equipment continuously.

Swimming Pool Water Chemistry

We get a lot of Ask the Pool Guy questions about what the proper water chemistry levels are for a swimming pool.

There are some things you must know. A few things you need to know. A few things that are good to know. And lots of things that are interesting to know (for some people.) We have tried to present the information, roughly, in that order. It is not unusual for a new pool owner to hire a pool cleaning specialist to teach them how to take care of their pool. Please note “their pool.” Maintaining the right balance of chemistry is different for every pool. Everything from climate, water source, bather load, and even personal preferences figures into the perfect water chemistry. Once it is set up and going, most people find it easy to maintain if they work a good schedule. Do not hesitate to ask your pool supplier questions and know that you can take in water samples (usually about 16 oz) for them to test.

Your Test Kit Is Your Pool Buddy

Choose a test kit that is simple to use and gives you “at a glance” readings on what you need to know about the chemistry of your water. Use it frequently and you will enjoy your pool experience so much more.

Understanding swimming pool water chemistry is an essential part of caring for and maintaining your swimming pool. Knowing how different factors such as pH, Total Alkalinity, Calcium Hardness, and Stain Producing Metals affect your pool water and pool equipment will save you a lot of time, money, and frustration. Knowing more will leave you better prepared to get your swimming pool water properly balanced the first time, saving you money by adding just what is



needed at the right time, instead of heavy doses to fix any previous oversight.

Now let's talk about the 1st and MOST IMPORTANT factor controlling your pool water balance.

- ✓ Always follow manufacturer directions for your particular test kit.
 - In obtaining samples for testing, be consistent. A good sample should be taken, away from return water inlets, about two feet below the surface of the water.
 - It's not a bad idea to keep a record (especially if more than one person touches the chemistry.)

Swimming Pool Water Chemistry Numbers

Quick Reference Ideal Numbers

- FCL 1.0-3.0 ppm
- pH 7.2-7.6
- TA or ALK 80-120
- CH 200-350 Gunitite Pools or 150-200 Vinyl Pools
- CYA 30-60
- TDS <1500 in non salt pools, the lower the number the better

Reading your test strip

In this sample based on the colors in the photo - This would be read:

pH -7.2 - 7.8
..... Getting on the low side

Free Available Chlorine - 1 - 2 ppm High

Total Alkalinity - 75 - 120 ppm



..OK, headed towards high

Stabilizer – 30-60 ppm Getting high

Calcium Hardness - 100 - 500 ppm ...Not on this test strip

To remedy this situation you would need to allow the Chlorine levels to drop, and then adjust the alkalinity.

Fresh Clear Pretty Water Still Needs to Be Balanced!

*If you start with fresh water, just because the water looks clear doesn't mean it is balanced. If you have an acid wash performed, a vinyl liner replacement, or have refilled your pool for any reason you **MUST BALANCE** your water.

We recommend testing your water once per week with test strips for a test kit, and bring a water sample to your local pool store once per month during the summer for comprehensive water testing.

Swimming pools with water chemistry issues will result in wrinkled liners, rusting stainless steel screws in the skimmer, return fittings, and lights, and etching or staining and deposits in the surface of gunite/pebble/marcite pools, as well as deterioration of your metals in your pool equipment, all of which can be costly to fix, and can be prevented!

Water Chemistry Quick Reference:

- FCL 1.0-3.0 ppm
- pH 7.2-7.6
- TA or ALK 80-120
- CH 200-350 Gunite Pools or 150-200 Vinyl Pools
- CYA 30-60
- TDS <1500 in non salt pools, the lower the number the better

Water Chemistry Quick Definitions:

- **FC – Free Chlorine** – Free chlorine does the hard work of killing bacteria and oxidizing contaminants. Chlorine must be constantly replenished.
- **TC – Total Chlorine** – When the free chlorine combines with contaminants, it becomes combined chlorine, or chloramines. In water, this form of chlorine has very little sanitizing ability, and no oxidizing ability. Total chlorine is just the sum of both combined chlorine and free chlorine.
- **pH – Acidity/Alkalinity** – Needs to be kept in balance to prevent irritation and protect the pool equipment. (7.2 to 7.6)
- **TA – Total Alkalinity** – Appropriate levels help keep the pH in balance. High levels can cause pH to rise. ***Always adjust TA before adjusting pH***
- **CH – Calcium Hardness** – Appropriate levels help prevent plaster damage. High levels can cause calcium scaling, low levels plaster etching.
- **CYA – Cyanuric Acid** – Protects chlorine from sunlight and determines the required FC level.
- **Salt** - The salt level should be in line with the salt generator manufacturer directions. Under 4,000 ppm according to the Pentair IntelliChlor Units (3,000-3,500)

A note about: Salt Water Pools - when you are generating chlorine with a salt water system you may find that the pH tends to run high. Liquid chlorine has a pH of approx. 8. To offset this pH you may need to add pH reducer or muratic acid to the pool. You can also keep the alkalinity on the low end of around 80ppm which should help the pH stay on the lower levels.

Total Hardness: (Total Dissolved Solids)

Total hardness in swimming pools is a measure of all the dissolved minerals such as calcium, magnesium and sodium.

TDS or Total Dissolved Solids is the measure of the total of all the soluble substances dissolved in the water. It is usually measured by assessing the electrical conductivity of the pool water.

Distilled or pure water has a TDS value of 0 ppm. Drinking water can have a maximum TDS value of 500 ppm according to EPA Water Standards.

For regular fresh water swimming pools, the maximum recommended TDS level is 1,500 ppm. Values above this can lead to problems such as cloudy pool water, staining of the pool surfaces, scaling, hard water and a salty taste. TDS values of up to 4,000 ppm and more have been noted in some well-balanced pool water so the individual levels of total alkalinity, hardness, conditioner, pH and metals should be considered along with the general state of the pool and its chemical demand. The TDS value should be used as an indicator of the volume of soluble particles in the pool relative to that of the fill water used.

In swimming pools using salt-chlorine generators, the large volume of salt added radically increase the TDS level, so any measurements are redundant due to the addition of salt.

If the pool water has become saturated with contaminants and the TDS level confirms this, the pool should ideally be drained and refilled with fresh water. There is no method to reduce TDS effectively without replacing some or all of the swimming pool water.

FC – Free Chlorine

Maintaining an appropriate FC level is the most important part of keeping your water in balance. It is important that you do not allow FC to get too low, or you run the risk of getting algae.

Free chlorine shows the level of disinfecting chlorine available (active plus reserve) to keep your pool sanitary. FC should be tested, and

chlorine added daily. If you have an automatic feeder or SWG, you can test it every couple of days. FC is consumed by sunlight, and by breaking down organic material in your pool. The level of FC you need to maintain depends on your CYA level and how much you use the pool.

pH- Acidity/Alkalinity

pH indicates how acidic or basic the water is. pH should be tested daily at first. Once you gain experience with your pool, less frequent monitoring may be appropriate, depending on your pool's typical rate of pH change.

pH levels below 7.2 tend to make eyes sting or burn. PH below 6.8 can cause damage to metal parts, particularly pool heaters with copper heat exchange coils. High pH can lead to calcium scaling.

For lowering pH use either muriatic acid or dry acid. To raise pH use soda ash.

TA – Total Alkalinity

Total alkalinity is a measure of the total alkaline substances found in the pool water. Total alkalinity indicates the water's ability to buffer pH changes. Buffering means you need to use a larger quantity of a chemical to change the pH. At low TA levels, the pH tends to swing around wildly. At high TA levels, the PH tends to drift up. TA should always be adjusted prior to making pH adjustments.

Total Alkalinity, or TA, should usually be kept at 80 – 120 ppm, though in high alkalinity waters this is often hard to achieve without resulting in an abnormally low pH.

Low Total Alkalinity

The results of a low TA may be one or more of the following:

- etching of the plaster, marbelite, marcite or tile grouting;
- corrosion of metal parts (pool heater, steps, scoop pole, . . .);
- staining of the pool's surfaces;
- green water;
- burning eyes and itchy skin;
- pH bounce (rapid fluctuations in pH).

Raising low total alkalinity

Sodium bicarbonate (bicarb) will raise the TA without excessively raising the pH. Regular pH-up will raise the pH as well as the TA and should not be used. Care should be taken to increase the TA over a period of time, adding a maximum of 1 pound of bicarb for each 6,000 gallons of water. The bicarb can be added at this rate every 4 days, until the required level is reached.

High Total Alkalinity

The results of high TA may be one or more of the following:

- pH keeps going up despite regular addition of pH-down;
- cloudy water ;
- burning eyes and itchy skin;
- reduced chlorine efficiency resulting in algae growth.

Lowering high total alkalinity

Regular small “acid shocks” with pH-down will reduce the pH while lowering the TA. This can be an extremely slow process and it may take weeks or longer to reduce high TA. One suggested method is as follows:

- turn off the pumps and allowing the water to settle;
- slowly add the pH-reducer into one spot in the deep end of the pool;
- allow the chemicals to “burn off” some of the alkalinity for 15 – 30 minutes (You may notice some bubbles rising to the surface. This is carbon dioxide and is indicative of the destruction of excess alkalinity.);

- turn the pumps back on and allow the water to mix thoroughly.

The above method should be used only when the pH is high and your pool requires pH-reducer. If the pH is normal, adding a shock will reduce the pH to undesirable levels resulting in further pool problems.

Care should be taken not to let the pH-reducer sit for too long as it will begin etching and softening the plaster, marbelite, marcite or tile grouting. It is also recommended to dilute the pH reducer in a bucket of water before adding to the pool to prevent this problem from occurring.

CH – Calcium Hardness

Calcium hardness indicates the amount of calcium in the water. Over time, water with low calcium levels will tend to dissolve calcium out of plaster, pebble, tile, stone, concrete, and to some extent fiberglass surfaces. You can prevent this from happening by keeping the water saturated with calcium. In a vinyl liner pool there is no need for calcium, though high levels can still cause problems. A plaster pool should have CH levels between 250 and 350. Calcium helps fiberglass pools resist staining and cobalt spotting. If you have a spa you might want to keep CH at at least 100 to 150 to reduce foaming.

You increase CH with calcium chloride. You lower calcium by replacing water or using a calcium hardness reducer which contains chelating agents to bond with the calcium to keep it trapped in solution.

Low calcium hardness results in corrosive water. The plaster surfaces or tile grouting softens and erodes, metal equipment and accessories oxidize and rust quickly, and the water becomes aggressive. This can lead to staining of the pool's surfaces as well as an eventual need for resurfacing.

High calcium hardness results in scale formation on the pool surfaces as well as scaling in the pipes, plumbing and filter. In extreme cases the water becomes dull and cloudy with the calcium precipitating out into the water rather than onto a surface. High calcium levels will also irritate swimmers, causing sore eyes in particular.

CYA – Cyanuric Acid

Cyanuric acid, often called stabilizer or conditioner, both protects FC from sunlight and lowers the effective strength of the FC (by holding some of the FC in reserve). The higher your CYA level, the more FC you need to use to get the same effect. It is important to know your CYA level so you can figure out what FC level to aim for. If you don't have a SWG or problems from extremely high amounts of sunlight, CYA is typically kept between 30 and 50. If you have a SWG or very high levels of direct sunlight, CYA is typically kept between 70 and 80.

You increase CYA by adding cyanuric acid, often sold as stabilizer or conditioner. CYA is available as a solid and as a liquid. The liquid costs a lot more, and generally isn't worth the extra expense. Solid stabilizer can take up to a week to fully register on the test, so don't retest your CYA level for a week after adding some. Solid stabilizer is best added by placing it in a sock in the skimmer basket. The pump should be run for 24 hours after adding solid stabilizer and you should avoid backwashing/cleaning the filter for a week.

In nearly all cases the best way to lower CYA is to replace water.

Pool water problems – copper, iron or manganese

Copper, iron or manganese in swimming pool water all cause the water to discolor without affecting the water's clarity much.

If the water changes color after chlorine (or any other oxidizer) is added, the swimming pool water probably contains a metal.

Which metal is in the pool water?

Green pool water – iron or copper

Brown pool water – iron (occasionally copper)

Purple/ black pool water – manganese

FerriTabs are an excellent product for removing iron, manganese and trace minerals from the water.

Adding Chemicals

Once you have tested your chemicals and completed the rest of the maintenance schedule for that particular day, add the necessary chemicals.

- ✓ **IMPORTANT:** When diluting chemicals, ALWAYS pour the chemical into a bucket that already contains water. NEVER pour water over ANY chemical!
 - Even if you don't read everything in this book (which we hope you will) read the instructions on all chemistry packaging.

pH

Pronounced: p H

How pH Affects Pool Water Chemistry

pH is a scale measuring the acidity or alkalinity of a solution.

The scientific definition of pH is “the negative logarithm of the Hydrogen ion concentration.”

Squeezed lemon, or vinegar, are sour or *acidic*. If we drank them we might take something alkaline, like bicarbonate of soda or magnesia, to neutralize the acidity in our stomachs or “raise the pH.” The pH scale



runs from 0 (highly acidic) to 14 (highly alkaline). Distilled water, being neutral is pH 7. (Don't ask me why the scientists could not pick a scale that was 1 to 10.)

Now instead of sour, let's use the term 'hydrogen ions', and instead of alkaline let's use the term 'hydroxyl ions'. Vinegar has many more hydrogen ions than hydroxyl ions. Conversely, soda ash and bicarbonate, being alkaline, possess more hydroxyl ions than hydrogen ions. In summary, acids produce hydrogen ions, alkalis produce hydroxyl ions. pH is the potential of a solution to yield hydrogen ions [H+].

Since the scale between 0 and 14 is logarithmic ... pH 8 is 10 times more alkaline than pH 7 and pH 9 is 100 times more alkaline than pH 7.

Now we are back to the scientific explanation of pH as 'the negative logarithm of the hydrogen ion concentration'. Negative because the more hydrogen ions, the lower the pH.

Bottom Line: The ideal level for the pH of swimming pool water is between 7.2 and 7.8. It should be checked daily and can be tested for with any pool water testing kit. A pH level above 7.8, referred to as being "too high," will lead to cloudy water, staining, scale deposits, filtration problems, and reduced chlorine efficiency. If pH falls below 7.2, called "too low", it could lead to corrosion of metallic pipes, etched plaster, rapid loss of chlorine residual, and possible irritation to swimmers. To maintain an ideal pH level in your swimming pool water, use a "pH Increaser" when the pH drops below 7.2 and a "pH Reducer" when the pH rises above 7.8.

Poolside Testing

Normally one tries to maintain the pH at 7.4 to 7.6. An exception is municipal or well water that contains some mineral imbalance. In such a case, it might be advisable to vary the pH slightly to compensate for this condition. Your local pool company can usually supply you with good advice, since they know the local water sources.

Note: New or newly plastered pools have an unusually high pH for the first few weeks of operation. This is caused by an "alkaline bleed-off" from the plaster and you should expect to experience some temporary difficulty in maintaining pH during the "curing" period.

Your test kit will indicate whether to lower or raise the pH in order to stay in the desired range. The most common need is to lower it.

Why is pH so important?

The pH value affects the amount of hypochlorous acid (free available chlorine) that is formed, and therefore determines the effectiveness of the chlorine as a killer of bugs and stuff.

At pH 6.5 --- 90% of the chlorine will be hypochlorous acid

At pH 7.5 --- 50% of the chlorine will be hypochlorous acid

At pH 8.0 --- 20% of the chlorine will be hypochlorous acid

Unfortunately you cannot run your pool at pH 6.5, since it would be acidic enough to corrode the metal fittings in your pool circulation system and it is too far from the human body's pH of 7.4 to be comfortable to bathe in. The compromise is close to the midpoint of 7.4.

At high pH:

- ✓ Scale will form on your pool surfaces, plumbing and fittings. This is because at a pH of around 8.0, the calcium in the water combines with carbonates in the water. Result? Calcium carbonate or scale.
- ✓ Calcium carbonate can form into tiny particles and float around in the water giving it a cloudy, turbid appearance.
- ✓ At high pH, the water will make your eyes sting and possibly give you a sore throat. This is not dangerous, but not comfortable either.

At low pH:

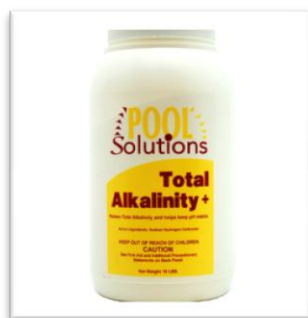
- ✓ Water can corrode metals, eating away at copper fittings and heat exchangers, and leaving metal oxides to stain pool surfaces.
- ✓ Under certain conditions the precipitated (particulate) metals can tint your hair. (If you want some horror stories, talk with a hair color expert.)

Remember, if you let the pH drift out of this range, you will have to use more chlorine to get adequate disinfection.

Total Alkalinity

Total Alkalinity is a measure of water's ability to neutralize acid. In swimming pool, hot tubs and spas, alkalinity is usually due to the carbonate content, although phosphates, silicates and cyanurates, if present, will contribute. Since carbonates are buffers, the alkalinity of the water is a measure of its ability to resist pH change. Total Alkalinity is increased by the addition of sodium bicarbonate (baking soda) and decreased by adding acid to the water (sodium bisulfate or muriatic acid).

Total Alkalinity is measured by performing a simple acid-based titration. A measured sample of water is titrated with a standard acid solution and the endpoint is indicated by a color change using a total alkalinity indicator.



Total Alkalinity is the measure of your pool water's ability to resist change in pH. Alkalinity does not have to be tested for as often as pH. It is a measure of the buffering capacity or the ability of pool water to resist a change in pH, therefore good Total Alkalinity will make it much easier to maintain good pH. The appropriate range for Total Alkalinity in pool water is between 75 and 120 ppm (parts per million). High Total Alkalinity (above 120 ppm) will allow your pH to slowly creep up and resist efforts to change. Low Total Alkalinity (below 75 ppm) allows your pH to "bounce" from one extreme to the other, making it very difficult to keep your pH in the appropriate range. Ideal Total Alkalinity (between 75 and 120 ppm) can be achieved by adding Alkalinity Increaser if the Total Alkalinity is below 75 ppm and pH Reducer if Total Alkalinity is above 120 ppm.

Confused? So were your pool professionals, so now they can show you how to do it. Ask them, they will be proud to answer.

Calcium Hardness & Water Balance

Originally the term hardness referred to the ability of water to lather with soap. If someone has a "water softener," one drop of dishwashing detergent will produce a lot more bubbles than most "city water."

There are two principal types of hardness in water, calcium and magnesium. We need only concern ourselves with the contribution of calcium hardness, as it applies to the concepts of water balance.



Methods to lower calcium hardness are difficult, but are frequently accomplished by dilution. Increasing the amount of calcium hardness, is easily done by adding calcium chloride. When testing calcium hardness the EDTA (ethenediaminetetra-acetic acid, a chelating agent) method is the method of choice because it is simple, rapid, and accurate. This is how test kits work.

It is important to maintain a balance of calcium between the water and the surrounding pool areas, such as pool walls, especially in a gunite pool.

Calcium Hardness is the amount of dissolved calcium in your pool water. The ideal amount of dissolved calcium is between 100 and 500 ppm. Calcium Hardness above 500 ppm (high Calcium Hardness) can cause cloudy conditions and scale deposits. Low Calcium Hardness (below 100 ppm) can lead to corrosion. To maintain an Ideal Calcium Hardness level and prevent cloudy water, add a Rust and Scale Remover when the Calcium Hardness Level rises above 400 ppm. A low calcium hardness level can be corrected by adding Water Hardness Increaser.

Dealing With Stain Producing Metals

Iron, copper, manganese, and cobalt are metals which commonly cause colored water or stains in pools. If you are fortunate enough to have the "ideal" fill water, and a properly constructed and maintained pool, these will not be a problem. Since ideal conditions rarely exist, we recommend the regular use of a good sequestering agent that will also remove metals from the water [FerriTabs] to continually protect the pool against stain producing metals. (More on this in the "Water Colors" section.)



Sanitizing Your Pool Water

Making sure, that all the preceding factors of pool water balance are within their appropriate levels, will allow you to sanitize your pool with fewer headaches and pounds of chlorine than ever before! Disinfecting is an essential element of any pool water treatment program. Stabilized Chlorine is designed to disinfect your pool water by releasing "free chlorine" into the water to control germs, other microorganisms, algae, and other organic matter. Because water conditions change rapidly, it is very important to test the water every day for chlorine residual. The "free available chlorine" reading should be between 1-2 ppm.

Chlorine

Chlorine is a sanitizing agent that is available in a variety of forms. It can be obtained as a gas (100%), as the liquid sodium hypochlorite (5-15%), and in various forms such as calcium hypochlorite (65%), lithium hypochlorite (30%), dichlorisocyanurate (55-65%) and trichlorisocyanate (80-90%). The most common chlorine you will use is trichlorisocyanate "pucks". When any of the chlorine products are dissolved in water, hypochlorous acid (HOCL) and hypochlorite ion (OCI) are formed; an excellent sanitizing compound that is responsible for the majority of the sanitizing power that we associate with chlorine. Conversely, chlorine in the form of the hypochlorite ion is not a good disinfectant and does not actively contribute in the purification process. The amount of hypochlorous acid and hypochlorite ion that is produced when chlorine is added to the water is directly related to the pH of that solution.

At pH 7.0, 75% of the chlorine exists in the active hypochlorous acid form. Increasing pH to 8.0 reduces the active hypochlorous acid concentration to only 25%. The term "free active chlorine" is given to both hypochlorous acid and hypochlorite ion. However, in pool and hot tub chemistry, we generally restrict the use of this term to represent only that chlorine which is in the form of hypochlorous acid. This is the form that disinfects and at normal concentrations it cannot be detected by taste or smell, nor will it cause eye irritation.

When free active chlorine reacts with ammonia, organic nitrogen compounds and other contaminants in the water, a class of combined

chlorine compounds are formed. These combined forms are known as chloramines. The chloramines do not exhibit any substantial sanitizing power and are actually the cause of some unpleasant problems. They are known to be responsible for eye and mucous membrane irritation and also the source of chlorine odors. As a result of these qualities, chloramines should be removed from the water when they have reached a level of .3 ppm or more. The accepted method for removal is known as "breakpoint chlorination" or "shocking". It is achieved by introducing ten times the combined chlorine content in the form of free available chlorine to the water. This large concentration of free chlorine will eliminate the combined chlorine and leave behind a residual that is in the form of free active chlorine.

Testing the chlorine level plays an important role in the maintenance of pool and hot tub water. It is also imperative that the method used for testing be able to distinguish between free active chlorine and combined chlorine. This is easily accomplished by using the DPD (N,N-diethyl-p-phenylenediamine) method used in test kits. Addition of two liquid reagents to a sample of water containing chlorine results in a color that indicates only free active chlorine. It is matched to a permanent color standard and the concentration is recorded. Subsequent addition of a third liquid reagent to the same water sample produces a color indicative of the total chlorine concentration and is matched the same way. Thus, the chloramine or combined chlorine content is calculated simply by subtracting the free chlorine value from the total chlorine value.

Bromine

Bromine is another sanitizing agent that can be used in the purification of water. It is available in a solid stick form, bromochloro-5.5 dimethylhydantoin, which contains 66% bromine, and 30% chlorine. It can also be obtained as a salt, sodium bromide, which is dissolved in water and converted to free bromine by the addition of an oxidizing agent such as potassium mono-persulfate.

When bromine is used as a disinfectant, the water chemistry of the bromine compounds differ from that of their analogous chlorine compounds. The forms of free bromine are hypobromous acid

(HOBr), which is a very active disinfectant, and hypobromite ion (OBr), which is considered to be relatively inert.

At pH 7.0, 98% of the bromine exists in the active hypobromous acid form, while increasing pH to 8.0 reduces this percentage to 83%. In the pH range used for pools and hot tubs, the active form of bromine is not as pH dependent as the active form of chlorine.

“Free bromine” is a term which represents bromine in the form of hypobromous acid. When free bromine reacts with contaminants in the water, combined bromine compounds called bromamines are formed. A striking difference between bromamines and chloramines is that bromamines are good disinfectants that exhibit activity similar to hypobromous acid.

Bromine can also be tested by using the DPD method but the testing procedure is slightly different from that used for chlorine. Since free bromine and combined bromine are active disinfectants, there is no need to distinguish between the two forms. The addition of two liquid DPD reagents to a water sample containing bromine indicates both the free and combined forms and is representative of the total bromine concentration.

Stabilized Chlorine

Dissolving chlorine in water makes it unstable and subject to decomposition by ultra-violet light. It has been found that cyanuric acid forms a loose compound with chlorine that inhibits the ultraviolet reaction without affecting the germicidal activity of chlorine. Cyanuric acid can be applied to pools, hot tubs and spas as the free acid, the sodium salt of the free acid and as sodium dichlorisocyanurate or trichlorocyanurate.

The use of cyanuric acid in public pools and spas is regulated in many provinces. Some provinces prohibit its use and others regulate it at a limit of 100 ppm while the manufacturers recommend a level from 30 to 75 ppm. Some health departments suggest that when cyanuric acid is used, the chlorine level should be increased.

The test for cyanuric acid is based on the fact that it reacts with melamine to form an insoluble but suspended product that makes the solution cloudy. This turbidity is an index of the cyanuric acid content and the cyanuric acid level is estimated by pouring the cloudy

solution into a calibrated tube until a black dot at the bottom of the tube is no longer visible. (Are you still with us? Now you know why we did not put this at the beginning!)

Conditioner/Stabilizer- Protecting Chlorine

At the start of each season it may be necessary to add Stabilizer. Sunlight can rapidly destroy chlorine residual in outdoor pools unless the pool water is "stabilized." Stabilizer, which is sometimes referred to as "conditioner," will shield your chlorine from rapid destruction by sunlight. It will make the chlorine you buy last longer, saving you money in the long run. Stabilizer acts as a sun shield to extend the life of chlorine up to 3 1/2 times by holding the useful form of chlorine in the pool water until needed, giving longer protection against bacteria and algae. It leaves no residue and is 100% soluble. "Stabilized" chlorine products (sticks, tablets, chlorine powder) contain some cyanuric acid which helps to maintain the proper level throughout the season.



Adding stabilizer

- ✓ With clean pool – backwash/clean your filter.
- ✓ Make a slurry of stabilizer and water.
- ✓ Very slowly add it through the skimmer.
- ✓ Let the pump running continuously for at least 48 hours.
- ✓ Do not backwash for 3 or 4 days after adding stabilizer.

Water Balance

Controlling the pH and sanitizer (chlorine or bromine) level in the water is not enough. When problems develop such as cloudiness, scaling, or corrosion, one must look further into water chemistry. Some years ago Dr. Wilfred Langlier of the University of Southern California developed a relatively simple formula for calculating what we call water balance. By using data for the solubility product of

calcium carbonate at various temperatures, he derived an equation as follows:

$$SI = TF + \log CH + \log TA + pH - 12.5$$

SI stands for saturation index, TF is a temperature factor, CH is calcium hardness, and TA is total alkalinity. When the appropriate figures are entered into the equation, the value of the saturation index tells us if the water is in balance. If the value is found to equal zero, the water is in perfect balance. If the value is found to vary from zero by plus or minus 0.3 pH units, the water requires attention. If the variation is +0.5, cloudiness and scaling of water will result. If the variation is -0.5, corrosion of concrete surfaces and possible metals will result. Since the Langlier Index was calculated using the solubility product of calcium carbonate it can be said that corrosion refers only to the corrosion of concrete surfaces which usually contain calcium in some form. However, when water is in balance at room temperature it can be rendered seriously out of balance when heated as in a pool, hot tub or spa. This could result in the deposition of a film of calcium carbonate on the inside surface of the heater tubes. Some would call this a protective layer; others would call it an insulating layer interfering with the efficiency of the heater. When this layer is removed by water that is out of balance in the corrosive mode, the metal loses its protective coating and corrosion could result. Water balance in a heated environment merits serious attention.

Common Water Chemistry Problems

Algae

Some algae growth gives water a greenish tint, while black algae usually grows to produce individual spots. A chlorine shock will often remove algae, but if the problem persists, draining and scrubbing the pool with acid may be necessary. Algacides such as quaternary ammonium compounds or copper based solutions are also used to fight algae.

Mustard Algae

Common algae in pools appears yellow-brown or “mustard” colored. Although it brushes off the walls of the pools easily, it quickly

returns. It often grows in shady areas when there is poor water circulation. And, it resists chlorine and shock treatment.

Solution: Use an algaecide along with chlorine shock. Follow label directions. Place all vacuum equipment – hose, head, pole, brushes, etc. into pool during treatment to get rid of as much of the algae as possible. Maintain a higher than normal chlorine reading for 4 to 5 days after the treatment.

Green Algae

Green algae is one of the most common problems for pools. It usually appears in corners or other areas where circulation is poor. Once established, green algae can grow explosively, but very quietly.



Solution: Use Algaecide along with chlorine shock. Follow label directions. It is also recommended to use a flocking agent, and always vacuum to waste or drain (do not backwash).

Black Algae

This is very resistant (stubborn) form of algae that clings to the pool's walls, floor, and especially into cracks. It especially likes gunite/concrete pools. The longer black algae are present, the longer it will take to get rid of it, so treat it as soon as you see it. Black algae can pit the mar cite finish in a gunite pool.

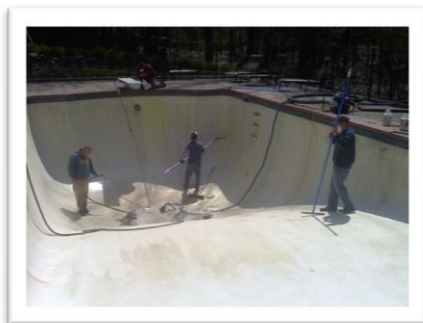
Solution: Brush algae spots vigorously with a stiff algae brush and pour algaecide along the sides where spots are visible. Run filter continuously for one hour and then add chlorine shock to the pool. Turn off filter and leave off for several days.

Preventing Algae

- ✓ Brush walls and pool floor weekly

- ✓ Vacuum pool weekly
- ✓ Use a maintenance dose of algaecide weekly
- ✓ Maintain a proper chlorine reading
- ✓ Keep your water chemistry balanced

On the right, a gunite pool getting an acid wash. The gentleman in the corner, closest to the acid, is wearing a face mask for safety.



Iron / Copper

Depending on the oxidation state, it may cause your water to be green, brown, or red. Copper is blue or blue-green and manganese/iron is brown or black. If there is a large enough concentration, either will cause problems. Test kits are available to measure the presence of these metals.

Cloudy water may be caused by unbalanced water with a positive saturation index with either pH, hardness, and alkalinity, or even all being high.



Occasionally, high chloramine levels have caused cloudiness and high total dissolved solids can also be blamed for cloudy water. Filtration problems can also be a cause.

Chlorine odors and eyeburn can usually be traced to high chloramine levels. Superchlorination will relieve this type of situation.

These are some of the possible issues:

- ✓ Eye and skin irritation
- ✓ Staining
- ✓ Unsightly wrinkles in vinyl liners
- ✓ Interference with the efficiency of sanitizers
- ✓ Corrosion of metals (pump seals, heaters, lights, etc.)

- ✓ Cloudy water
- ✓ Scale build up (white chalky appearance) on pool surface as well as inside filter and heater
- ✓ Pitting and corrosion of gunite/concrete pools

Treatment usually consists of chlorine shock or alum flocculation to remove these metals. There are also sequestering products available which will keep the metals tied-up and prevent them from staining.

Automatic Pool Cleaners



Why should you consider one

Vacuuming your pool can be a hassle. You don't always have the time to do it as often as you should and, let's be honest, sometimes you just don't want to spend the time. Yet, it's important to keep your pool clean. Although no one likes to swim in a dirty pool, which is usually motivation enough for homeowners to keep their pools clean, this is not the only reason.

It's also important that your pool be clean for *your friendly neighborhood swimming pool service company*. When we come to service your pool, we usually need to be able to see the bottom of your pool. Of course, if the reason you're calling us is because your pool is cloudy, we'll help you with that. But if your pool is just cloudy because it's dirty, we generally suggest some chemicals to add, advise what you should do, and then ask you to call us back when you can see the bottom, and that's not just so that we can make another service call.

Try an automatic pool cleaner. It makes life easier for you and for us, and you may even use your pool more often if it stays cleaner and you have more time to enjoy it.

There are several brands to choose from and different styles and models to suit your pool and your needs. We recommend Dolphin pool cleaners. It's what we use in our own pools and the only brand we recommend to customers, at this time. In the end, though, the decision is yours. Do your research and decide on what automatic cleaner is right for you. Be sure to note which cleaners only work on the floor and which also clean the sides. You can always contact us if you have questions about choosing an automatic cleaner. Talk with your friends, who have pools. You can even talk with those friends that don't have pools, but, unless they are in the pool industry, they may not be very helpful with this particular decision.

Suction Side Automatic Pool Cleaner



These attach to the suction side of your plumbing. The suction side refers to the pipes and fittings that bring water out of the pool to be filtered; that water which is being "sucked" out of the pool by the filter pump. They attach to one of the suction ports at the pool, usually this port is the skimmer, or a separate vacuum port, where the cleaner's hose can attach. With the hose attached and the filter pump running, suction is created on the underside of the cleaner. The cleaner moves randomly or automatically around the pool with motion created by a device that gives a stop/start pulsing of water. As the unit travels, debris is sucked up through the neck, into the hose, past the suction port, through the pipe, and hopefully stops at the filter pump strainer basket. Smaller debris passes to the filter and is caught there. Adjustments on the hose, the unit itself, and flow volume will create different cleaning patterns, to maximize pool coverage.

Pressure Side Cleaner



These cleaners attach to the pressure side (return) of your circulation system. The water that is being pumped or "pushed" back to the pool powers these units, which have their own hydraulic power plant inside. Being on the pressure side, these units have distinct advantages. They are helpful in

distributing clean, filtered water around the pool and, having their own debris bag, they don't compromise the filter system. Even with the bag full, a pressure cleaner still operates, stirring up debris for the filters to catch. Emptying the bag is not big deal.



Robotic Pool Cleaner

These are self contained low voltage electric cleaners with a transformer, plugged into a regular wall outlet, and a long (50 ft) cord. It has two motors; a pump motor which draws debris into the unit's filter and a drive motor which

moves the unit around the pool. A robot cleaner includes a self contained filter, which is easily cleaned. They do well with their coverage. Some units are computer chip controlled, and some even have remote controls so that you can steer the unit from a lounge chair! Since they are not attached to the pool's circulation system, just the power cord, they produce no resistance or back pressure on the filtering. Their cost can be more than suction or pressure side cleaners.

Making The Choice Between Automatic Pool Cleaners

So which is the right automatic pool cleaner for you? All three types will get the job done. If you purchase a suction side automatic pool cleaner you may need to backwash, or clean your filter more often as a result of the debris being sucked into the filter system. The



pressure side automatic pool cleaners work off the return line of your pool's circulation system adding clean, filtered water all around your swimming pool. Because a robotic pool cleaner is self-contained (functions independent from your pool's circulation system) you may find you do not need to run your pool's filtration system as often as before. As the pool cleaner increases in functionality, you can expect an increase in price. Suction side cleaners are generally the least expensive, robotic cleaners the most expensive, and pressure side pool cleaners falling somewhere in between.

Yes, there is one more type. Organic. You can hire a pool professional (or neighbor's kid) to do it for you on a regular basis. Most pool companies offer weekly and bi-weekly options. If you pay them a lot, I am sure that they would even be there every day. No, you cannot list them as a dependent on your income tax, for only that reason.

Troubleshooting

Pump Suddenly Stops Working

Check these areas first:

- ✓ Has the breaker tripped? If so, reset the breaker. Also, check to make sure that the fuse has not become defective.
- ✓ Was the power to the equipment accidentally shut "off"? If so, turn the power back "on."
- ✓ Is the water level low? If so, fill the pool to the standard operating water level (half way up the skimmers, but no more than $\frac{3}{4}$).
- ✓ Have any of the valves accidentally been closed? If so, open the valves.
- ✓ Are the baskets clean? If not, clean out the pump and skimmer baskets.
- ✓ Is the lid properly sealed on the pump housing? If not, seal the lid properly. You may need to lubricate the lid O-ring to get a better seal.
- ✓ Has the time on the time clock elapsed? If so, reset the time clock.

Beyond any of these checkpoints, call your local pool professionals for a service call.

Pump Only Hums

Is the breaker tripped? If so, reset the breaker. If it keeps tripping, check the electrical circuit.

A hum means the thermal switch, within the pump, is telling the pump that something is wrong. This thermal switch shuts down the pump to prevent overload and complete disaster, it is a safety mechanism. Call your local pool professionals for a service call.

Pump runs but will not move water

Pump may have lost its "Prime". With pump motor off, prime pump by removing lid from pump strainer. Fill strainer with water from garden hose until pot is full. (Note: If gate valve has been installed

on pump suction line, close before filling pot.) When pot is full, replace strainer pot lid and tighten securely. Place valve in backwash position (open gate on suction line, if system is so equipped) and turn pump on. When water begins to run freely, turn pump off, place valve in filter position and turn pump back on.

Pump Is Loud

Is the noise coming from the pump housing (the front of the pump) or is it coming from the motor (the back of the pump)?

A loud noise is usually the result of the bearings going out, in the motor. But, the loud noise could also be the impeller somehow getting loose, moving out of place, and grinding against the pump housing.

Either way, you will need to call your local pool professionals for a service call. But, with this troubleshooting technique, you can really help diagnose the problem, which will perhaps reduce the length of the service call, thus saving you money.



Is the pump sucking air? If so:

- ✓ Make sure the level of the pool water is at the standard operating water level (at least half way up the skimmer).
- ✓ Make sure that the pump and skimmer baskets are clean.
- ✓ Make sure all of the valves are fully open.
- ✓ Make sure that the lid O-ring is in place and that the lid is properly sealed.

Beyond this, call your local pool professionals for a service call. As you know, if it is the impeller (within the pump housing) or the motor, you will need to set up a service call. Likewise, if its air that is causing the loud noise, and the water level is okay, the baskets are clean, the valves are fully open, and the O-ring and lid are properly sealed on the pump housing, then *cavitation* may be occurring—where the pump is struggling to circulate more water than is available to it.

There can be a number of causes for cavitation. Whatever the cause, you will need to call your local pool professionals for a service call.

The Breaker Keeps Tripping

Call your local pool professionals and explain the situation, a phone call is free; a service call is not. Your local pool professionals may advise you to call an electrician first, to make sure it is not a wiring or any other electrical problem. If this is the case, **only a licensed electrician can rectify the problem.** If the electrical is fine, the problem is probably a faulty motor. Just call your local pool professionals first in order to determine the best (and most economical) game plan.

Short Filter Runs Between Cleanings

Check these areas first:

- ✓ Is water chemistry adequate? If not, restore water chemistry.
 - If pH, Alkalinity, or Hardness levels are high, scale may develop in the plumbing, restricting flow, causing filter runs to be shorter.
 - Low chlorine (or its alternative) levels make conditions more favorable for algae growth. Algae can clog the filter media.
- ✓ Are your cleaning cycles sufficient? Only clean your filter when your pressure gauge shows a pressure increase of 8-10 psi above your standard operating pressure.
 - Sand filter and DE filter = backwash.
 - Cartridge filter = clean the pleated filter elements with a garden hose and pressurized nozzle
- ✓ Is the filter media sufficient? If not, replace the filter media.

Sand filter:

- ✓ Has the correct sand been used? "Playground" sand will not work. You need to purchase the proper silica sand from your local pool professionals.

- ✓ Is the sand too old? If so, contract your local pool professionals to perform a sand change.

DE filter:

- ✓ Is the proper amount of DE powder being used? Too much DE powder will not sit properly on the DE grids, which will reduce the effectiveness of the DE powder, causing a shorter filter run between cleanings.

Cartridge filter:

- ✓ Are you sufficiently cleaning the pleated filter elements? Do so. The majority, as well as the most stubborn, dirt and debris will find its way deeply imbedded within the pleats. Make sure to thoroughly hose off the pleats.
- ✓ Are the pleats torn or frayed, or is the base of the filter element cracked? If so, replace the pleated filter elements.

Sand Is On The Floor Of The Pool

(For those of you with a sand filter only)

A lateral, which is positioned at the bottom of your sand filter, has either cracked or is broken, allowing sand to pass through the filter, enter the return (plumbing) lines, and enter the pool, via the return jets. Either way, all the sand has to be removed. Then, each lateral must be removed and inspected in order to determine which lateral(s) are cracked or broken. Once found and replaced, the sand has to be put back into the filter. If it has been a few years since your last sand change, use new sand. Sand is fairly inexpensive and it will save you the headache of having to do this again in the near future. Sand is typically replaced every 4-5 years.

When replacing the sand, be careful. The weight of the sand could crack or break your new (fragile) laterals, causing the same tedious and time-consuming procedure to have to be repeated. If you do the job by yourself, fill the sand filter full of water until the laterals are submerged underwater. Then, very slowly, pour the sand into the filter; the water will disperse the sand evenly. (Be sure to avoid getting sand into the center tube, to which the laterals are attached.) You might be better off contracting your local pool professionals, who have experience handling the fragile laterals.

Other reasons for sand in the pool may includes:

- ✓ Pump may be oversized.
- ✓ There may be too much sand in the filter.
- ✓ You may not be backwashing and rinsing long enough.
- ✓ If the sand is fine like silt, it may be debris coming back through your filter system.

DE Powder Is On The Floor Of The Pool

(For those of you with a DE filter only).

- ✓ If the DE grids are torn or frayed, some DE powder may pass through the filter, enter the return (plumbing) lines, and enter into the pool, via the return jets.
- ✓ It could be the manifold within the DE tank or damaged O-rings, causing the DE powder to enter the pool.

Call for service.

Heater Will Not Heat

Check these areas first:

- ✓ Is the supply (natural gas, propane, or electricity) on? If not, turn it on.
- ✓ Is the pilot light lit? If not, light the pilot light. This is only for those heaters that require a manual ignition of the pilot light.
- ✓ Are the baskets clean? If not, clean the skimmer and pump baskets. Full baskets will restrict water circulation. The pressure switch in the heater requires sufficient circulation for the heater to heat.
- ✓ Is the filter dirty? If so, clean the filter. A dirty filter will also restrict water circulation. Again, the pressure switch in the heater requires sufficient circulation for the heater to heat.
- ✓ Is the water level sufficient? If not, fill the pool to the standard operating water level (half way up the skimmer).
- ✓ Are the valves open? If not, open all the valves.

If none of these ideas work please call your pool professional and schedule a service call. A heater is kept in good running order by using it. If the heater is not used, rust will appear, spider webs and nests may be found, and mechanical parts may wear.

If water chemistry is out of balance, the heat exchanger could be corroded to the point of premature failure. This is an expensive replacement and another good reason to monitor your water chemistry.

Leak Detection At The Equipment

Attempt to locate the source of the leak: pump, filter, heater, automatic chemical feeder, connector fitting, any threaded fitting (plug/cap, pressure gauge, air relief valve) or the plumbing. You may just need to tighten a fitting. If the leak is just a few drops and might even be condensation, don't worry about it. If it's flowing, call your local pool professionals for a service call.

Leak Detection For The Structure Of The Pool

You will lose water, just from natural evaporation. This can be reduced with physical or chemical sun blankets. If you are losing more water than normal, note how fast it is going down and contact your pool service professional. They may ask you to see if it stops at a particular level, such as the bottom of your skimmers or built in light. This is a good indicator where the problem is. Some leaks are easily fixed with pool patching cement, some require extensive digging to get to the underground plumbing.

Regardless of your pool type (gunite, vinyl-liner, fiberglass, or aboveground), your local pool professionals will help you build a game plan of how to detect the source of the leak and get it fixed.

Underwater light goes out

Check switch, circuit breaker or check the GFCI. Check/change bulb.

FAQ

Salt Chlorine Generating Systems!

Do you enjoy your pool, but don't love the chlorine chemicals that you have to add to the pool? Consider converting your existing in-ground pool to an environmentally friendly alternative with a salt generating system. (Note: If your pool area smells a lot like chlorine, there is probably too much chlorine.)

Saltwater swimming pools have been around in other parts of the world for years and are becoming even more popular in the United States.

How Saltwater Pools Work

By adding a chlorine generator to your pool's plumbing system, the generator works with salt added to the water to produce the active chlorine required to keep your pool water clean, so you don't need to continually add chlorine and other chemicals. You don't have to specifically do anything prior to the installation of a salt system, though keeping your water in balance is always recommended.



The conversion will start by installing the chlorine generator along side of your other pool equipment. It's installed in your pool's water return lines (after the filter and heater) by cutting into the return lines and installing PVC piping to run water through the chlorine generator then back into

the return line. The generator needs a power source, so it will be wired into the pool pump circuit, so that the generator turns on and off at the same times as the pool pump.

Then you'll need to add salt to your pool. The amount of salt your pool requires depends on the size of your pool. Estimate 50 pounds of salt per 1,200 gallons of capacity. Yes, that may sound (and look)

like a lot of salt. It's close to adding only one teaspoon of salt to one gallon of water. Many people will not even be able to taste the salt.

Once installed, turning on the pump circulates the salt water through the system, including the chlorine generator. Magic? No, chemistry. Through an electrolysis process, the salt molecules (sodium chloride) are separated into sodium and chlorine. Concurrently, a hydrogen atom is freed from the water molecules. Know that the hydrogen and chloride atoms combine to form sodium hypochlorite (chlorine) that actually purifies the water in your pool. After sanitizing your pool water, the chlorine chemically recombines with sodium, turns back into salt, and the process begins all over again.

Taking Care of Your Saltwater Pool

Maintaining chlorine generating systems is simple. Modern systems test for salt levels and have indicator lights to let you know if salt levels need to be adjusted. Consider that many chlorine generating systems are self-cleaning as well, using a built-in polarity reversal function to clean themselves. (Go ahead, call it magic.)

Test the salt level in your water periodically, using salt test strips available at pool supply stores.

Recommended Product: IntelliChlor Salt Chlorine Generator

The IntelliChlor Salt Chlorinator uses salt to produce all the chlorine a pool needs, safely, effectively, and automatically. It has the same sanitation performance as manually adding chlorine, without the drawbacks. No need for customers to buy, transport, store, and dump in chlorine compounds. Result: fewer resources are used in the production, packaging, and transportation of these chemical compounds.

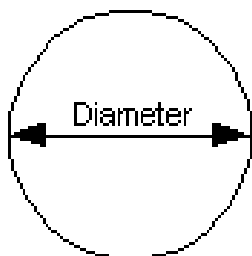
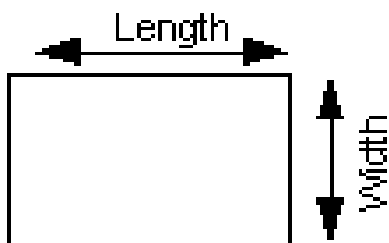


Calculating Water Volume

Do you know how many gallons of water are in your pool? Any discussion about chemical additions requires that you know the approximate gallons of water in your pool. Knowing the capacity of your pool (in terms of approximate gallons) is mandatory if chemical additions are to be made correctly. To assist in calculating the approximate gallons of water in your pool, here are pool industry-endorsed formulas based on the shape of your pool:

Rectangle / Roman-End / Grecian / Square

Length x Width x Average depth x 7.5

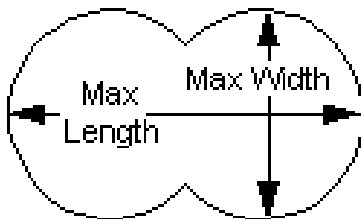
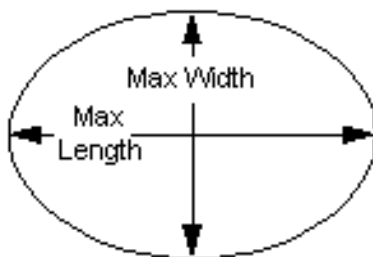


Round

Depth x Diameter x Diameter x 5.9

Oval

Longest Length x Longest Width x Average Depth x 5.9

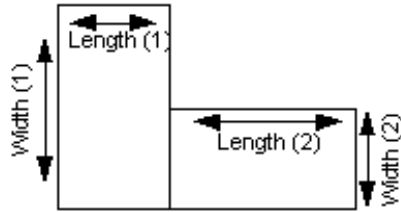


Kidney

Longest Length x Longest Width x Average Depth x 5.9

Any L-Shape

Break the "L" into two separate rectangles (or squares). Then, use the formula for a rectangle (or square) for each section. Finally, add the two sections together.



Length x Width x Average Depth x 7.5 + Length x Width x Average Depth x 7.5

Free Form Or Irregular Shapes

Consult with the pool professional that built your pool, as they may have the dig diagrams or spec sheets on file that list the total gallons. If they do not have the information on file or if they are out of business, call the local pool professional that you currently use; they will be able to offer a formula based on your specific free form or irregular shape pool and its specific dimensions (length, width, and depth) in order to help you calculate the total gallons of your pool.

How much water does my pool need?

Your pool needs enough water to function properly. This means adequate water flow running from your skimmer and main drain into your system for filtration, and back into your pool.

If your valves give you the option, you can isolate the main drain or the skimmer(s). This is nice when you are opening the pool in the spring and your water level is not up to the level needed to operate your skimmer. Turn the skimmer to the closed position and you can still run the main drain and the returns.

We have seen many systems over the years that are troublesome and the most important thing for your plumbing system is to be easy to operate. If you have water coming in through the main drain and skimmer(s) into your pump, you need to have water returning to your pool.

The correct operating level for your water at the skimmer(s) will vary depending on your pool set up. As a general rule, you need enough water in the pool so when water is drawn through the skimmer(s) you don't create a whirlpool or suck air into the pipe. Sometimes a pool looks full, but when the pump starts pulling water through the skimmer(s), it is pulling so fast that the skimmer can't refill fast enough. If you get any hissing, gurgling, or sucking noises from your skimmer, chances are something is obstructing the water flow or you don't have enough water in the skimmer. The water level should also be, just low enough, that debris such as floating leaves can pass under the upper level of the skimmer(s) so that it can be caught in the skimmer basket. If you are not sure of the proper level for your pool, call your pool professional, we are happy to advise you.

Do monitor your pool water level daily and add water if it appears to be too low. Some water will evaporate. Some may be splashed out during the pool's use. If you have backwashed your system, or vacuumed on waste, you will have "wasted" some water from the pool. Typically your pool should have a few inches of water in the skimmer(s) as leeway, so you don't or shouldn't have to fill the pool every day. If you are filling your pool every day, or noticing a 1/2 inch to an inch of water loss a day, chances are you have a leak or some other issue that should be looked into.

A pool under construction often looks much bigger or smaller than when it is full of water depending on your perspective. It's always interesting to see just how much goes in there!



If you hire a water truck to fill your pool, when it is newly installed or during your season opening, you will also have an idea how much water is in your pool. Trucks vary in the load they carry, ranging from small loads of about

5,000 gallons per truck, to some of the larger residential trucks carrying 12,000 gallons of water. When we do a vinyl liner replacement or a gunite renovation, typically we ask the homeowner

to bring in a truck load or two, or sometimes three, of water to get the pool full quickly. It can take a long time with a garden hose. Especially in instances where water quality is an issue, in areas of high iron or other mineral content, having water brought in by truck is also an excellent idea.

Should I ever drain all of the water?



Draining your pool can be a risky business, unless you've got a professional to advise you and a legitimate reason for doing so. This pool, on the left, is having its liner replaced, which is a pretty good reason for a professional to empty

your pool.

IMPORTANT: You should not drain a pool unless you have a very specific reason to do so, and/or you are doing it with the assistance of a pool professional.

A fiberglass pool with no water in it is like a giant bathtub, and if the water pressure in the ground is more than the force keeping the pool in the ground, you can have what is known as a “pop out”. This is very expensive problem to have to adder ss.

The same is true for a gunite pool. The gunite pools are usually equipped with a hydrostatic valve, it job is to pop open if the ground water pressure is more than the water in the pool. Providing this is working properly, you should be fine. Your pool professional would be able to let you know. In the case of performing an acid wash on a gunite pool, or when we are doing a remarcite or repebble job, our crews will also drill holes in the bottom of the gunite pool to allow any ground water to come through the holes while work is being performed. Rather little holes that are easy to fill, than big cracks that are not.

A vinyl liner pool is the least expensive to fix if you “accidentally drain the pool” or if you have problems. The liner depends on water, to keep it set properly in the bottom of the pool. If you drain a liner pool, the liner can shift and cause wrinkles or trap bubbles under the liner. Is this a major problem? Not really, the pool should still be able to function and hold water, but it may not be pretty or aesthetically pleasing. If you have continuous water problems under the liner, you may need to address the drainage or add a sump pump system to help handle the ground water. In a worst case scenario, if you need to replace a liner you are talking a few thousand of dollars. A fiberglass or gunite pool would take tens of thousands.

Why does it take so long to get help?

Each swimming pool company maintains a list of customers. These are typically pools the company knows well and owners that have a relationship with the company. If a service request comes in from one of these customers, the company already has an idea how to handle the issue and what to expect on site. This means they can delegate the job prior to going out to the pool in most cases. This helps to cut down on lead time and the preferred customer status helps to solidify a quicker timeline.

If a service company is unfamiliar with a pool, they need to send someone out who can diagnose what is going on with a pool and how to best handle it on the spot, in many cases. This service person's time is very valuable, especially in peak pool season. There's a balance between visiting pools to give quotes (meaning money later, maybe) and sending a qualified service tech out to do an installation that results in a billable visit. There's a balance of both, however, the best time to get quotes is when the phones are slower.

For example: There are 50,000 plus pools in Michigan's five county area (Oakland, Washtenaw, Wayne, Macomb and Livingston.) The average service company in the area can service about 500 customers very effectively. If you use Google or even word of mouth, and ask around, there are a handful of companies that get recommended. There's certainly room for more service companies in the area, though for now, let's deal with what we've got to work with (more about the new service business plan being launched by our company later).

If you can imagine, the minute the sun starts shining in May, all 50,000 pools are opened (in a window of about 30-45 days). This is when you find the issues, service calls, and troubleshooting appointments. That's trying to funnel a whole lot of people through a very narrow service window. (Who was calling in March and April - when were available?! Once the danger of frozen water pipes is over, a pool can be opened. You can always put a safety cover back on. In warm winter/spring years this is a very good thing to get a jump on algae growth.)

So what can you do to encourage quick service and turnaround of your request?

1. **Create a relationship** Once you find a good service company, stick with them and let them get to know you and your pool. That means when you call we can diagnose over the phone and predict what your needs might be. This means less time for both of us because we'll have the right things on the truck. Customer loyalty also means that we'll be loyal to you, and fixing your issue quickly, if you've been loyal to us. If you are always seeking the lowest price and jumping from company to company, it costs both of us more time. If we are more expensive than another company, chances are excellent that we are saving you money with experience, quality, and little extras that we do not charge you for separately.
2. **Maintain your pool** Follow our instructions and recommendations. We are telling you these things to help you. Preventative maintenance now means less last minute emergency calls later. (Think Zinc Anodes if you have a salt pool – and if you don't have one, or don't know what it is, CALL US RIGHT NOW!)
3. **Be a good customer** This means treating your service company and service techs with respect and understanding, especially when the season is very busy. Just imagine if you had 500 people calling you right now to fix the pool. You want to help everyone, but you have to prioritize.
4. **Be patient** Again, we can't stress this enough. We want to be able to help you, as quickly as we can. Servicing pools is

an art and those most qualified to do the best work are in the highest demand.

5. **Plan your fixes** If you know something is coming up, make a call now to your service company and let them know what you would like to do. If it's a major project, we can help advise you when the best time to complete it will be, and let you know when we'll best be able to service your need.

The pool season in Michigan, and in most mid-western areas, faces similar issues with the seasonal nature of the business. The pool season is hot from Mid April to Mid October, with the very busy times at opening (May) and closing (September). There are many qualified companies, ready to serve the needs of the area customers – sometimes the requests have to be delegated, prioritized, and planned, and that just might be why it took a pool company so long to get out to your pool.

What if I buy a house with a pool?

The fastest way to have a new pool is to buy a house that has one! If you do purchase a house with a pool, it is wise to hire an experienced pool professional, just like you hire a home inspector. Your professional can look over the pool and the equipment to give you an idea of the pool's condition. If the pool is unopened and/or neglected, their report is even more important. Most of the time, it is cheaper to fix a pool than to "fill it in", yet it can be an investment to "get a pool going again." As a seller, allowing your pool professional to talk with a potential buyer may be a good selling point, if you've been taking care of your pool. If they have been doing maintenance, they will be able to assure the buyer of the condition and, for first time pool owner, show them how easy it is to enjoy a pool.

If you are going to build one, of course, everything depends on the size and design of the pool and how much money you want to spend. It also depends on the Pool Builder's method of operation. If they contract out concrete, tiling, or other work, they are at the mercy of those sub-contractors' schedules. Cement has to be worked at certain temperatures and some weather conditions are prohibitive, but a lot can be planned around the seasonal weather. Winter is great for planning! Of course an indoor pool can be built almost any time.

On the low end, figure on at least 2 or more months, once the plans are approved. On the high end, well, a special, really cool, three year project could be a lot of fun.



GLOSSARY

Algae

Algae are microscopic plants which can literally transform your pool water from clear blue to the appearance of a stagnant pond in 24 hours. They are introduced into the pool by airborne spores, from make-up water, from covers which have been dragged over grass & moss, and from vegetable matter. Onset is quite common after thunder storms, especially if the water temperature is high.

Algae take up dissolved carbon dioxide and therefore cause the pH to rise rapidly.

There are hundreds of different species of algae - some green, some yellow ("mustard algae"), others black and even pink. They can be the clinging type and colonize the pool surfaces, or float suspended in the water. The spores are normally not a problem, if chlorine levels are maintained. It's a lot easier to prevent algae than to clean it out.

WARNING: *DO NOT ALLOW BATHERS INTO A POOL HEAVILY POLLUTED WITH ALGAE - YOU MAY NOT SEE THEM IF THEY ARE IN DISTRESS AND SOME STRAINS OF ALGAE CAN BE TOXIC.*

Algaecide

An "as-needed" chemical. If algae does occur, algaecides are used to help kill, well, algae. The majority of algaecides are liquid, but some types are granular. Once you determine the type of algae, by the color, you can purchase the appropriate algaecide and begin the proper treatment. Read the instructions on the label to determine the amount to add, how it should be added (most manufacturers of algaecides recommend pouring it straight from the bottle), and other precautions.

Note: In conjunction with the algaecide, you will also need to use a chlorine-based shock and engage in a labor-intensive and time-consuming maintenance schedule to eliminate the algae.

Algistat

An optional chemical. Algistats are used to help prevent algae and may be used in conjunction with other mandatory chemicals, in order to help prevent an algae outbreak. Algistats are typically packaged and sold as "Preventative Algacide," or "Maintenance Algacide." Algistats are liquid. Read the instructions on the label to determine the amount to add, how it should be added (most manufacturers of algistats recommend pouring it straight from the bottle), and other precautions.

Alkalinity Increaser

Used to raise alkalinity, the scientific name is Sodium Bicarbonate. Sodium Bicarbonate is typically packaged and sold as "Alkalinity Increaser," "Alkalinity Up," or "Alkalinity Plus." Sodium Bicarbonate is granular. Read the instructions on the label to determine the amount to add, how it must be added (either diluted in water or broadcast straight from the container), a maximum amount (per 10,000 gallons of water) that can be added at one time, and other precautions.

Automatic Vacuum Cleaners

A vacuum cleaner that will vacuum your pool for you. Regardless of the brand and type of automatic vacuum cleaner, if you can afford one, buy one. They are a worthwhile investment. But, even if you own an automatic vacuum cleaner, you will still need to use your manual vacuum assembly in these situations:

- ✓ The pool has just been opened (after previously being winterized). After opening, a large amount of dirt and debris is typically present on the walls and floor.
- ✓ Any time that a large amount of dirt and debris are present on the walls or floor.
- ✓ Algae is present.

Automatic Water Leveler

Not considered maintenance equipment, but a very valuable accessory for your pool. Due to evaporation and splash-out, you will lose water, which will have to be replaced. The Water Leveler will sit

on your pool deck and hang over the pool, attached to your garden hose. A float, installed on the part that hangs over the wall and into the pool, is easily adjusted to turn "off" the Water Leveler when the fill water reaches the desired water level (half way up the skimmer(s)). This accessory is very worthwhile.

Backwash Hose

Some pools do not have a plumbed-in waste-line. Usually because local code or restrictions in your area did not allow for the waste-line. If your pool does not have a waste-line, purchase backwash hose from your local pool professionals. Backwash hose will allow you to manually create a waste-line any time you need one.

Bromine (BCDMH)

Bromine, like chlorine is a member of the halogen family, i.e it kills bacteria, viruses, and algae and it oxidizes. Elemental bromine is a reddish brown color and is liquid at room temperature. The form used in private and commercial pools is the tablet version - BCDMH, or bromochlorodimethylhydantoin. (It becomes less daunting if you split it up into its component bits - *bromo chloro di methyl hydantoin*). BCDMH dissolves in water to release hypobromous acid and hypochlorous acid. The hypochlorous acid serves to regenerate the spent bromine. It is dosed into the pool by means of a circulatory feeder.

The main reason that bromine is *not* chosen as often as chlorine, is that it is fairly expensive. Bromine's niche is with spas (hot tubs), as it is more stable than chlorine in the hotter water temperatures.

Brush

Typically, a brush is 18" in length and has either nylon bristles or stainless steel bristles. The brush is used to brush away dirt and debris, as well as algae, from the pool walls and floor. There are also specialized brushes, such as an algae brush (only used to brush away algae, go figure) and a corner brush (to brush away dirt or debris, as well as algae, from the corners, where the walls meet the floor, and at the faceplates of the skimmers and return jets, where stubborn dirt, debris and algae is capable of escaping the standard 18" brush).

The nylon bristle brush can be used with any type of pool to brush away dirt, debris, or Green & Mustard Algae. The stainless steel bristle brush can only be used on a concrete, gunite, shotcrete, or fiberglass pools to remove stubborn Black Algae, stubborn dirt, and any stains or scale. A stainless steel bristle brush can never be used with a vinyl-liner pool (it is too abrasive and may tear the liner).

Calcium Hardness

This is the amount of *dissolved* calcium (plus some other minerals like magnesium) in the water. The word *dissolved* is important - if you can see calcium scaling up the plumbing or the surface of the pool, it is no longer dissolved. Too much calcium means cloudiness and scaling (a white chalky appearance). Too little calcium can lead to the water satisfying its appetite for calcium by taking it from your grouting and result to corrosion of pool surface, filter, heater, ladder, etc.

Calcium Hardness Increaser

Used to raise Hardness levels, is granular. The scientific name is Calcium Chloride and is typically packaged and sold as "Hardness Increaser," "Hardness Up," or "Hardness Plus." Read the instructions on the label to determine the amount to add, how it should be added (either diluted in water or broadcast straight from the container), a maximum amount (per 10,000 gallons of water) that can be added at one time, and other precautions.

Note: There is no product that is packaged and sold as a Hardness Decreaser. If your Hardness level is too high, you will have to drain your pool, partially or completely, in order to lower the Hardness level.

Calcium Hypochlorite

A dry chlorine available in the form of granules or tablets, made by the absorption of chlorine in lime. It is un-stabilized, making it suitable for regular sanitization or for shock treatment, and produces 65% available chlorine. It tends to raise the pH, but this, and the presence of calcium, is beneficial for pools in soft water areas.

Cement

See Gunitite.

Chlorine - Cl₂

An element of the halogen family. It dissolves in water to form hypochlorous acid (HOCl or free chlorine - the principal water sanitizer) and hydrochloric acid.

It is the most widely-used chemical that pool owners use to kill bacteria, living organisms, ammonia, and any other contaminants (such as dirt, debris, and algae spores) that are in pool water. The two most common forms of chlorine used are granular chlorine (whose scientific name is "Dichlor") and chlorine tablets (whose scientific name is "Trichlor"). Chlorine tablets come in two sizes: 1" tablets and 3" tablets.

Chlorine Alternatives

There are numerous. In addition to bromine, some other popular alternatives include Bacquacil, mineral systems, chlorine generators (which produce chlorine from salts), iodine, and fluorine. Since over 90% of pool owners use chlorine or bromine (with the dominant percent still being chlorine), they will merit mention. Many of these alternatives have elicited superior results immediately, but they still do not merit significant mention until they pass the ultimate test-the test of time. Although iodine and fluorine have been around for some time, the frequency of their use is limited. If you have chosen one of these (or any other) alternatives, then go visit the pool professionals that sold you the alternative. They should have complete documentation of support materials to assist you and answer all your questions.

Chlorine Demand

The amount of chlorine needed to destroy pollutants in pool water such as bacteria, algae and other contaminants.

Chlorine Donor

One of the many chlorine compounds available which, when dissolved in water, will provide chlorine or hypochlorous acid.

Chlorine Lock

With insufficient water replacement, the amount of stabilizer (cyanuric acid) in the water builds up over a period of months or years to levels where it becomes a bit of a problem. This makes it difficult for the dichlor or trichlor to react with the water and produce sufficient hypochlorous acid (free chlorine) to achieve a satisfactory kill time against bacteria and other micro-organisms.

The cyanuric acid level, at which this occurs, is a matter of debate amongst the experts. Some say it happens as low as 80 ppm cyanuric acid, others go for a figure nearer 200 ppm. In the experience of the author, you lose significant performance at around 160 ppm.

However, if your pool dealer implies that the chlorine is completely inactive, he is misleading you (there is evidence that kill times actually start to improve at 400 ppm!).

If you think your pool is over-stabilized, kill times can be restored by running the pool at raised levels of free chlorine (DoE guidelines give clearance for up to 4 ppm). But the longer term solution is to re-energize the pool by introducing more fresh water. This can be done by longer than usual backwashes or, if absolutely necessary, by a partial water replacement. Do not let the water level fall too far in liner pools.

Chlorine Residual

The amount of chlorine left over after the chlorine demand has been met.

Chlorine Stabilizer

The chemical name is cyanuric acid. Be reassured: cyanuric acid is a polymerised urea; it has nothing whatever to do with cyanide or isocyanates. It is also sometimes misleadingly called conditioner.

It can be obtained as a granular product, but it is also formed when the stabilized chlorines (dichlor or trichlor) are dissolved in water. They dissociate (split up) into hypochlorous acid (free chlorine) and cyanuric acid (stabilizer).

Low levels of stabilizer are beneficial because they prevent wastage of free chlorine by the u/v waves in sunlight, but high levels are a

disadvantage because they make it take longer for the chlorine to kill micro-organisms.

If you are using dichlor or trichlor, there should be no need to add extra stabilizer. However, it can be helpful to stabilize pool water with cyanuric acid if you sanitize your pool with sodium hypochlorite or calcium hypochlorite which have no inbuilt stabilizer.

DANGER: do not mix these chemicals in the dry state.

Clarifier

An "as-needed" chemical. If water is cloudy, it may be due to thousands of small particles (bacteria, dirt, and other debris) that are suspended in the pool water. These particles are so small that they escape both the chemicals and the filter and so a Clarifier is used to restore water clarity. Clarifiers are liquid. Read the instructions on the label to determine the amount to add, how it should be added (either diluted in water or poured straight from the bottle), and if it should be added before or after shocking the pool; clarifiers are often used in conjunction with shock to restore water clarity.

Combined Chlorine Or Chloramines

Also known as chloramines and made up of monochloramine (NH_2Cl), dichloramine (NHCl_2) and nitrogen trichloride (NCl_3). They are formed when free chlorine reacts with nitrogen compounds which are introduced into pool water by bather pollution, and which in turn break down into ammonium compounds (hence, chlor + amine).

They are comparatively ineffective as sanitizers, and nitrogen trichloride in particular, is responsible for the stale chlorine smell associated in the old days around poorly maintained public pools. Chloramines must be broken down by raising the level of free chlorine.

Cover Cleaner

Solar Cover Cleaner - A cleaner used to clean off your solar cover. If purchased, the cleaner should be applied quarterly and prior to storage. If you want to clean your solar cover, lay it on concrete, spray it with your garden hose, brush it with your vacpole and pool brush, rinse it off again, and put it back on the pool. If you do use

the product, read the instructions on the label before applying. NOTE: Never lay your solar cover on the grass; it will take no time at all for the sun to penetrate the cover and burn your grass.

Winter Cover Cleaner - A cover cleaner could be used to clean off your winter cover. If you spray off your winter cover with a hose and a pressurized nozzle, brush it with your vacpole and pool brush, rinse it off again, allow it to dry completely, and store it properly, you will not have to worry about mold or mildew growing on your winter cover. If you do use a cover cleaning product, read the instructions on the label before applying.

Cyanuric Acid

Chlorine, by itself, is susceptible to being destroyed by the ultraviolet rays of the sun. Cyanuric Acid, which is typically packaged and sold as either "Conditioner" or "Stabilizer" will protect chlorine from being destroyed by the sun. Although both granular chlorine and chlorine tablets contain Cyanuric Acid as an ingredient, the amount contained is merely a trace. Therefore, the periodic addition of Cyanuric Acid ("Conditioner" or "Stabilizer") is necessary. Cyanuric Acid is granular. Read the instructions on the label to determine the amount to add, how it should be added (either diluted in water or broadcast straight from the container), as well as other precautions; you should not BACKWASH your (sand or DE) filter for at least 48 hours after adding Cyanuric Acid. Cyanuric Acid is NOT used with Bromine or any other of the alternatives to chlorine.

Defoamer

An "as-needed" and rarely used chemical. Defoamer is liquid and as the name dictates, will eliminate foam from the pool water. It is used more with spas (hot tubs).

Dichlor

Try saying this name - the chemical name is sodium dichloroisocyanurate dihydrate. One of the stabilized chlorine donors (trichlor is the other.) It is called dichlor because there are only two atoms of chlorine bonded to nitrogens on the molecule (sodium is bonded to the third nitrogen) trichlor has three. Usually sold in the form of granules of 55% available chlorine. When

dissolved in water, it dissociates (splits up) into hypochlorous acid (free chlorine) and cyanuric acid .

Enzyme Cleaner

An "as-needed" chemical. Enzyme cleaners are liquid and used to breakdown and eliminate the dirty water line (also called the water ring or scum ring) that is often seen just above the surface of the water. Products such as suntan lotions, underarm deodorants, and women's make-up, as well as body oils & dirt, can attach to the pool walls (just above the surface of the water) to cause this water line. The Enzyme cleaner reacts to break them down into their simplest state, liquid, in order to eliminate this water line. Read the instructions on the label to determine the amount to add, how it should be added (most manufacturers of Enzyme cleaners recommend pouring it straight from the bottle), and other precautions. Typically, foam will appear immediately after adding an Enzyme cleaner. This foam is okay, it signals that the enzymes are reacting with the water line to break it down into the liquid state. Many pool owners wisely implement an Enzyme cleaner in their routine maintenance schedule.

FerriTabs

Ferri-Iron Tabs are swimming pool water treatment tablets that help eliminate the discoloration caused by iron and manganese. They have been formulated for use in all filters (see package labels).

These double-action tablets are formulated to help decolorize water that has been colored by IRON or MANGANESE. These discoloring insoluble materials are removed from the water by charge neutralization and flocculation. This non-toxic formulation is completely soluble in water and contains no caustic or corrosive chemicals, diatomaceous earth, alum, or any chemicals that will alter the pH or chlorine level of the water.

- ✓ Make sure pool water has a pH of 7.2-7.6, and contains a measurable amount of chlorine by adjusting with chemicals as necessary. Chlorine will not effect the Ferri-Iron Tab action on Iron or Manganese. Make sure the pool filter is in good operating condition and has been turned on.

- ✓ Drop 1 tablet for each 3000 gallons of pool water into the skimmer basket. In large pools that have multiple skimmers distribute the tablets.
- ✓ For best results, add the required tablets over a period of a few hours, while the filter is operating. In order to permanently improve the water quality, the filter must be thoroughly back-washed within 18-24 hours after treatment.
- ✓ In pools that have severe problems, repeat dosage and back-wash procedures after 24-48 hours.
- ✓ In order to prevent a recurrence, when adding make up water, add 1 tablet for each 3000 gallons or less of fresh water.
- ✓ Ferri-Iron Tabs can be shipped anywhere in the United States and most other countries.

Filter Cleaner

Filter Cleaners do not have a direct effect on water chemistry. They do, however, clean the filter, which does have a direct effect on water chemistry. Filter Cleaners can be liquid or granular. Make sure you purchase the specified Filter Cleaner for your type of filter. Read the instructions on the label to determine the amount to add and how it should be added.

Note: since Filter Cleaners are less of a chemical and more of a cleaner, it is okay to pour a Filter Cleaner in the skimmer. *It is NEVER recommended to pour or place any chemical in the skimmer.*

Garden Hose Operated Vacuum

Some pools do not have suction lines in order to vacuum the pool with a manual vacuum assembly and so a garden hose operated vacuum is used. There are two types of vacuum units: the brush-style vacuum unit and the wheel-style vacuum unit. The brush-style vacuum unit is used for vinyl-liner pools. The wheel-style vacuum unit is used for concrete, gunite, shotcrete, and fiberglass pools. Your standard garden hose will attach to the vacuum unit. The running water from your garden hose will create suction, drawing the leaves, dirt, and other debris into the silt bag of the vacuum unit.

Once full, empty the silt bag, reattach it to the vacuum unit, and start again until the silt bag is full, etc. until you're done.

Many pool owners with the capability to use a manual vacuum assembly will also have a hose operated vacuum unit in their possession. If there is an enormous amount of leaves and other large debris on the pool floor, too much to net out and such a large amount that would clog your vacuum hose, the hose operated vacuum unit works great. The only drawback is that the silt bag can only hold so many leaves and other debris until the unit must be taken out of the pool, emptied, reattached, and sent back into the pool.

Gunite

What type of pool do I have? I thought it was concrete?

You're right, sort of. Here's everything that you wanted to know about gunite, shotcrete, and concrete (thank you wikipedia).

Before we get into that, the photo above is of a gunite pool in Highland, MI built by Legendary Escapes. The pool was formed, and then shot in gunite, as was the base for the waterfall that you see in the background. The gunite surface was then finished with pebble. Sometimes a white marcite coating will be used to seal the gunite surface.



Shotcrete is concrete (or sometimes mortar) conveyed through a hose and pneumatically projected at high velocity onto a surface, as a construction technique.

Shotcrete is usually an all-inclusive term; gunite is a term sometimes used for

some dry-mix types.

Shotcrete undergoes placement and compaction at the same time due to the force with which it is projected from the nozzle. It can be impacted onto any type or shape of surface, including vertical or overhead areas.

Shotcrete, then known as gunite, was invented in the early 1900s by American taxidermist Carl Akeley, used to fill plaster model of animals. He used the method of blowing dry material out of a hose with compressed air, injecting water at the nozzle as it was released. This was later used to patch weak parts in old buildings. In 1911, he was granted a patent for his inventions, the “cement gun”, the equipment used, and “gunite”, the material that was produced. Until the 1950s when the wet-mix process was devised, only the dry-mix process was used. In the 1960s, the alternative method for gunning by the dry method was devised with the development of the rotary gun, with an open hopper that could be fed continuously. Shotcrete is also a viable means and method for placing structural concrete.

Shotcrete is today an all-inclusive term that describes spraying concrete or mortar with either a dry or wet mix process. However, it may also sometimes be used to distinguish from gunite as a wet-mix. The term shotcrete was first defined by the American Railway Engineers Association (AREA) in the early 1930s.^[1] By 1951, shotcrete had become the official generic name of the sprayed concrete process.^[1]

Gunite refers only to the dry-mix process, in which the dry cementitious mixture is blown through a hose to the nozzle, where water is injected immediately before application. Gunite was the original term coined by Akeley, trademarked in 1909 and patented in North Carolina. The concrete is blasted by pneumatic pressure from a gun, hence “gun”-ite.

The term “Gunite” became the registered trademark of Allentown, the oldest manufacturer of gunite equipment. Other manufacturers were thus compelled to use other terminology to describe the process such as shotcrete, pneumatic concrete, guncrete, etc. Shotcrete emerged as the most commonly used term other than gunite, and after the later development of the wet process came to be used for both methods.

Bet you're glad you know all that now?

Hard Water

Water is considered hard if its calcium hardness is over 250 ppm and its alkalinity is over 150 ppm.

Hybrid Swimming Pool

A hybrid swimming pool is a combination of the elements of a gunite pool with a vinyl liner pool.

Hybrid Pool: A pool with a basin created using both technologies of vinyl liner and gunite. Vinyl is comfortable for bathers and gunite allows the designer freedom with shapes, sills, slides, waterfalls, grottos, swim-up bars/tables, ceramic tile lines and more. Where vinyl meets gunite is where the magic of this dual personality pool comes together. The final look is seamless.

The building of hybrid swimming pools has been pioneered by Al Curtis {Ask the Pool Guy} of Legendary Escapes. Curtis has revolutionized the swimming pool industry with this new design and construction technique, resulting in truly extraordinary pools.

Hypobromous Acid (Free Bromine)

Hypobromous acid or free bromine is the main disinfectant in pools on bromine or BCDMH. It is formed (a) by dissociation when BCDMH is dissolved in water and (b) by the reaction between hypochlorous acid and spent bromine (bromide ion). It is more expensive than the chlorine donors, but is effective over a much wider range of pH values. Free bromine levels should be maintained at 4 – 6 ppm, in soft water areas.

Hypochlorite Ion (OCl-)

The species of chlorine resulting from dissociation (splitting up) of hypochlorous acid (HOCl) into its constituent parts - H⁺ and OCl⁻ (hypochlorite ion). This happens if the pH is too high. If it is too low the hypochlorous acid dissociates into molecular chlorine (CL₂). Hypochlorite ion is a poor disinfectant because the negative charge creates an obstacle to penetrating the wall of the cell. Hypochlorous

acid is 100 times faster than hypochlorite ion in killing a micro-organism.

Hypochlorous Acid - HOCl

Also known as free chlorine, it is formed when calcium hypochlorite, dichlor, trichlor or chlorine gas are mixed with water and dissociate. This is the main pool water disinfectant.

Hypochlorous acid acts (a) as a sanitizer killing potentially harmful bacteria and micro-organisms (it can enter a cell's wall and upset its protein and enzyme function), (b) as an oxidizing agent eliminating organic and inorganic impurities by a process similar to combustion e.g. it burns out pollution introduced by bathers such as sweat and urine (yes, I'm afraid people do).

Useful amounts of hypochlorous acid can only be obtained if the pH is within certain limits or if the stabilizer level is not too high.

Langlier Saturation Index

This calculator generates the Langlier Saturation Index (LSI) for a pool or spa. The LSI assesses the overall balance of the water. Enter your readings on the Calculate Saturation Index and determine whether your water is corrosive, balanced or scale-forming. Note: you must enter all parameters to calculate this index correctly. Search for "Langlier Saturation Index Calculator" on the Internet for available on-line calculators.

Manual Vacuum Assembly

Consists of the vac head, the vacuum hose, the vacpole, and perhaps a vacuum seal plate. There are two styles of vac heads: the brush-style vac head and the wheel-style vac head. A brush-style vac head is used for vinyl liner pools and the other is used for concrete, gunite, shotcrete, and fiberglass pools. One end of the vacuum hose connects to the vac head and the other to your skimmer. If needed, a vacuum seal plate should be placed over the skimmer in order to trap optimal suction to complete the vacuum. Some pools have a designated vacuum line. Use the vacpole to maneuver the vacuum assembly across the pool floor and walls.

Metal Sequestering Agent

An "as-needed" chemical. Metal Sequestering Agents can either be liquid or granular and are used to treat odd tints to the color of the pool water, stains, or the formation of scale. These may have resulted from the minerals that are present in the tap water that is used to fill the pool (such as copper, iron, manganese, magnesium, or calcium) or from poor water chemistry. If an odd tint, any stains, or the formation of scale are present, the condition can easily be rectified by re-attaining and maintaining proper water chemistry and by using a Metal Sequestering Agent, which will rid the water of these excess minerals. Read the instructions on the label to determine the amount to add, how it should be added (either diluted in water or poured/broadcast straight from the bottle/container), and other precautions. Issues such as "minerals," "the presence of metals," "odd tints," "stains," and "scale" cause much confusion. If you have any doubts, talk with your pool professional.

Muriatic Acid

An alternative to lower pH and Alkalinity. Muriatic acid is in liquid form. Read the instructions on the label to determine the amount to add, how it must be added (either diluted in water or poured straight from the bottle), a maximum amount (per 10,000 gallons of water) that can be added at one time, and other precautions. NOTE: Be extra careful when handling muriatic acid.

Nets

There are two styles of standard pool nets:

- ✓ The deep net, which is often called a leaf rake, has a wide opening and a bag shaped net. This style of net is primarily used to reach leaves or other large debris that have settled to the pool floor. The deep net can also be used to skim leaves and debris off the surface of the water, but the skimmer net is best at performing this task.
- ✓ The skimmer net, which has a shallow net, is primarily used to remove leaves, grass clippings, debris, or insects that float on the surface of the water.

Ozone

Ozone is not an "alternative" to chlorine. It's a "supplement" to be used with chlorine. Ozone alone cannot replace chlorine, but when used together, the two are quite effective. It is also quite effective when used with bromine. Although somewhat popular in pools, ozone's niche is with spas (hot tubs).

Parts Per Million (ppm)

Equivalent to milligrams per liter (mg/l). The standard way of quantifying the amount of chlorine or minerals in the water. To give some idea of the scale, 1 ppm is equal to 1 milligram per liter. So, 5 ppm is 5 milligrams for every liter of water. Or a 5/1,000,000 ratio.

pH

pH is the measurement of acidity of water and measured on a scale of 0 to 14 with 7 being neutral (water). A pH below 7.0 means the water is very acidic, as the pH approaches 8.0, the water becomes very basic (alkaline).

Proper pH levels allow the other chemicals to do their work. Low or high levels can cause damage to a vinyl liner. Under the right circumstances, with pH below 7.0, the liner can actually grow and develop unsightly wrinkles. We refer to those as pH wrinkles. There is no way to remove them besides installing a new liner. High pH greatly accelerates the aging process and shortens the life of the liner.

Chlorine is much less effective at higher pH levels. At a pH of 8.0; chlorine is only 22% effective.

Use pH+ or pH- to adjust the pH of your water. Always address the Total Alkalinity level first as it can cause the pH level to fluctuate.

pH Decreaser

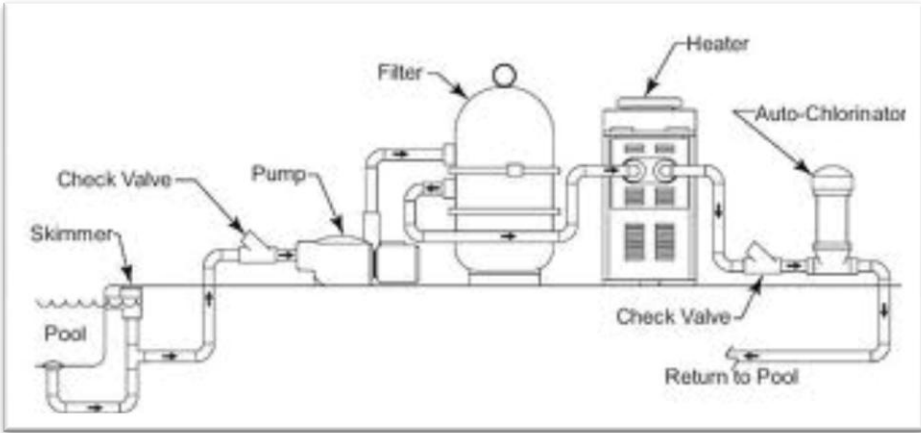
Used to lower pH and Alkalinity. The scientific name is Sodium Bisulfate and is typically packaged and sold as "pH Decreaser," pH Down," or "pH Minus." Sodium Bisulfate is granular and is commonly referred to as "dry acid" (as opposed to the liquid Muriatic Acid, which is an alternative to lowering pH and Alkalinity). Read

the instructions on the label to determine the amount to add, how it must be added (either diluted in water or broadcast straight from the container), a maximum amount (per 10,000 gallons of water) that can be added at one time, and other precautions. Note: Sodium Bisulfate is also used to lower Alkalinity. *There is no product that is packaged as an "Alkalinity Decreaser."*

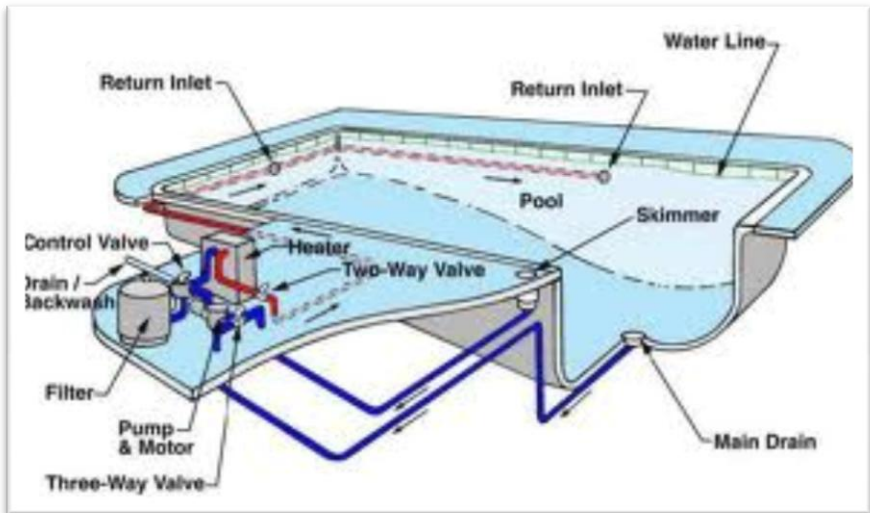
pH Increaser

Used to raise pH. The Scientific name is Sodium Carbonate and is typically packaged and sold as "pH Increaser," "pH Up," or "pH Plus." Sodium Carbonate is granular. Read the instructions on the label to determine the amount to add, how it must be added (either diluted in water or broadcast straight from the container), a maximum amount (per 10,000 gallons of water) that can be added at one time, and other precautions.

Pool Filtration System (Example)



Pool Filtration Diagram



ppm

See: Parts Per Million.

Salt

System

Salt systems are a huge trend in pools. The chlorine generators use ordinary salt and break it apart into sodium and chlorine. The

chlorine cleans your pool and clears the water; then, when the chlorine has done its job, it hooks back up with the sodium and turns back into salt. The salt is recycled continuously, day after day, reducing maintenance requirements even more. A salt system is the easiest, most effective and convenient way to keep your pool clean. Chlorine generators provide the same sanitation performance as manual chlorine addition without the drawbacks—you never have to handle chlorine. You don't need to buy and store chlorine compounds and you'll never have to deal with the smell, stinging eyes and bleached bathing suits.

A zinc anode protects the metal components of your swimming pool from corrosion. The zinc anode will be the first thing to corrode, saving the other parts of your pool from corrosion. If you have a salt pool make sure you have a zinc anode. *They are often overlooked, and are a critical part of your system!*

Shock

Shocking a pool is mandatory with chlorine, bromine, or any other alternative. Shock is a granular compound. If you use chlorine, you will want to predominantly use a chlorine-based shock (such as Calcium Hypochlorite or Lithium Hypochlorite). But, you can supplement your shock schedule with a non-chlorine shock periodically. If you use bromine, you will want to predominantly use a non-chlorine shock (such as Potassium Peroxymonosulfate). You can supplement your shock schedule with a chlorine-based shock periodically. If you use an alternative to chlorine (or bromine), then check with the pool professionals, that sold you the alternative, to assure that you are using the appropriate type of shock. There is controversy in the industry as to how often you should shock your pool—some say weekly, some say twice per month, some say monthly, and some say only as needed. As you get to know your pool, you will learn what your pool needs. No, neither a 1910 bathing costume or tiny polka-dot bikini will shock your pool.

Shock Chlorine

Usually a short-hand way of referring to sodium hypochlorite or calcium hypochlorite, which can be dosed into the pool at a high rate, without increasing levels of stabilizer (cyanuric acid).

The purpose of shock dosing is to overcome a problem such as algae growth or unpleasant chlorine smells. It does this by satisfying chlorine demand i.e. by killing bacteria, algae, and other micro-organisms, and breaking down accumulated organic impurities to leave a chlorine residual.

Shotcrete

See Gunitite

Soda Ash

An alternative to raise pH. Like Sodium Carbonate (pH Increaser), Soda Ash is also granular. Read the instructions on the label to determine the amount to add, how it should be add (either diluted in water or broadcast straight from the package), a maximum amount (per 10,000 gallons of water) that can be added at one time, *and other precautions.*

Soft Water

Water is considered soft if has a hardness of under 50 ppm as calcium carbonate and an alkalinity of under 30 ppm as calcium chloride. The pH can be rather unstable in soft water areas, but alkaline chlorine donors such as calcium hypochlorite will help to increase hardness as will the addition of calcium chloride.

Superchlorination

Much the same idea as shock dosing with chlorine, except that the term is used for routine (usually fortnightly) treatment where chlorine levels are raised to around 10 ppm to *prevent* proliferation of bacteria or algae infestation.

Test Device

You must constantly test for chlorine (or its alternative), pH, and Alkalinity at the poolside. Approximately once per month, or if unusual pool readings occur, take a water sample to your local pool professionals and have them test every chemical reading on the computer. Test chlorine (or its alternative), as well as pH and Alkalinity, 2 - 3 times per week during normal weather conditions and under normal use. Test chlorine (or its alternative) daily during periods of scorching temperatures, unbearable humidity, and intense

sunlight, as these are the times when bather load is at its highest. Test chlorine (or its alternative), as well as pH and Alkalinity, after heavy rainfall, before and after a pool party, and, of course, if water appears to be cloudy, murky, or beginning to form algae. The only way that you can accurately depict the condition of your water is by administering the actual tests. Either with test strips or test kits, the tests only take minutes to perform. Test strips and reagents (or tablets) for test kits are also inexpensive.

Tile & Vinyl Cleaner

A cleaner to clean the walls (and tiles, if applicable) of concrete, gunite, shotcrete, or fiberglass pools, and to clean liners of vinyl-liner pools. This product is fairly effective for eliminating light dirt, discolorations or stains. The product is safe to mix with your pool water, but, if the pool structure (walls or floor) of any type of pool is extremely dirty, discolored or stained, then contract your local pool professionals and let them perform a drain and clean. Although a Drain and Clean is fairly expensive, it really is an investment versus a service call.

Total Alkalinity

Closely related to pH, but the two must not be confused.

Total alkalinity is a measure of the amount of alkaline materials in the water. This alkalinity will usually be present as bicarbonates, but with a very high pH carbonates and hydroxides can be present as well. Alkalinity is a measuring of the alkaline materials dissolved in water. With the alkalinity in the range of 100 to 150 ppm, it helps pH to resist fluctuations. If the alkalinity is low the result is "pH bounce" in and out of range.

The relevance to pH is that the amount of alkali (hardness) in the water will determine how easy it is for changes in pH to occur.

If the alkalinity is too low (below 80 ppm) there can be rapid fluctuations in pH - i.e. there is insufficient 'buffer' to the pH. High alkalinity (above 200 ppm) will result in the water being too buffered - it will make it difficult to adjust or correct the pH.

Pools with an alkalinity problem often coupled with a pH problem will see issues with the heater core. When these are out of balance

water becomes aggressive, and will corrode the inside of your heater core (which contains copper – so if you have copper in your water and have no other source, it's most likely from your heater). If this happens, you want to remedy your water balance problem quickly and you may need to replace your heater core, or in some cases, the entire heater.

High alkalinity and high pH can lead to cloudy water and scale formation. Low alkalinity can result in corrosion and discomfort to bathers.

Total Chlorine

Free chlorine plus combined chlorine. Hence chloramine levels can be worked out by the formula: Combined chlorine = total chlorine (from DPD no 3 tablet) - free chlorine (DPD no 1 tablet).

Total Dissolved Solids (TDS)

This apparent contradiction in terms refers to conductive chemicals that can accumulate in the pool particularly when the water evaporates, or when the pool is not 'diluted' with sufficient fresh water. You cannot see them because they are dissolved, but this does not stop them from corroding metal parts (pumps, plumbing, filters) on account of their conductivity. They are mostly made up of chlorides and sulphates. Chlorides can accumulate with long term use of sodium hypochlorite. Regular addition of alum based clarifiers (aluminium sulphate) and dry acid (sodium bisulphate) can increase sulphate levels. Periodic backwashing and water replacement are the best ways of controlling TDS.

The maximum acceptable level of TDS for swimming pools is 1,500 ppm. At values above this, we begin to notice stains in the pool. It will also reduce the activity of any chemicals you add, preventing them from doing what they're supposed to. The water may also become cloudy.

As a measurement of the total amount of matter (minerals, chemical residue, dust, dirt, and other particles) that remains in water, the primary contributing factor that leads to TDS is evaporation. As water evaporates, only the water itself, like distilled water, evaporates. Minerals, chemical residue, and other particles are left behind and remain in the pool water. With evaporation, you need to continually

add water. As you add tap water up to the standard operating water level (half way up the skimmer), you are also adding additional minerals and particles. Although these minerals and other particles from tap water do add to the TDS reading, it is extremely minimal. The biggest factor is that this new tap water will soon be introduced to chemicals. It is the chemical residue that is not filtered and remains in the pool water that has the greatest effect on increasing TDS. Whenever chemicals are added, the TDS reading will increase.

Eventually, this matter that remains in the pool water will act as a sponge, consuming your new chemicals, rendering them virtually ineffective. It will take many years (approximately 6-8 years) for the TDS reading to become so high that it will consume your chemicals before they can engage in their intended purpose. (6-8 years is a guideline only.)

There is no chemical that can lower the TDS reading into an ideal range. Rather, a TDS reading can only be lowered by draining your pool, either partially or completely, and adding fresh water. If it has been some time since your pool was last drained and cleaned, there are certain indicators that may tell you that your TDS reading has probably reached or surpassed its maximum parameters:

- ✓ Continual addition of excess chemicals.
- ✓ Water chemistry tests fine, but water is still not clean, clear, blue and sparkling.
- ✓ Various water chemistry problems include:
 - Colored yet clear water (the water has an odd tint, but you can still see the pool floor).
 - Algae growth despite a good chlorine (or its alternative) reading and proper overall water chemistry (pH and Alkalinity).
 - Varying and false readings on chemical tests.

If any of these are the case with your pool, or if other water chemistry issues arise, despite the continual testing and addition of chemicals, the TDS reading has either met or exceeded the maximum. The Pool Guy recommends that you contract your local pool professionals and pay them to perform a drain and clean, it really is more of an investment than a service call.

In a salt pool, where the salt is dissolved in the water and is set to run at between 3500 ppm and 4000 ppm, the salt needs to be omitted from the TDS measurement.

Trichlor

Short for *trichloroisocyanuric acid* - a bit easier to say than the chemical name for dichlor. Another stabilised chlorine donor. It is called trichlor because there are three atoms of chlorine bonded to the nitrogens on the molecule. This makes it stronger than dichlor which only has two.

Usually sold in the form of slow dissolving tablets of 91% available chlorine. When dissolved in water, trichlor dissociates (splits up) into free chlorine and cyanuric acid.

Vacpole

A long aluminum pole that can extend to various lengths in order to complete its intended maintenance procedure at any area and at any depth of the pool. It attaches to your nets, brush, vacuum assembly, and other maintenance equipment AND also to the "Shepherd's Crook," which is a life-hook (a life-saving device).

Water Balance

Water balance takes into account such factors as pH, total alkalinity, calcium hardness, total dissolved solids and pool water temperature to see whether there is a corrosive or scale forming tendency in the water. A mildly scale forming situation is preferred as a thin coating of calcium will protect the metal fittings in the circulation system.

Zinc Anode

A zinc anode is a critical part of your salt water swimming pool system. It becomes the sacrifice for trace electrical charges in the water and was designed to stop metal erosion and plaster discoloration due to galvanic corrosion. It keeps your skimmer basket in place or bolts permanently inside or outside any skimmer basket.

Zoo

Consider posting your pool rules and enforce them or you will have one, a Zoo that is. Here are some things to consider:

- ✓ No glass containers in the pool area. Broken glass is very hard to see in the water and will cut your vinyl liner, if you have one.
- ✓ No diving – unless your pool was designed for it.
- ✓ No pushing – not everyone can swim and they may hit something harder than their head.
- ✓ Children should take frequent toilet breaks and clean up well. Wash hands. (Really.)
- ✓ Swimming Babies – It's never too early to learn – yet even a small amount of fecal matter can make another swimmer sick. Be sure the child is clean before entering the pool. Everybody out, if there is an incident. (Note: Swim Diapers are no guarantee of containment.) Also, change diapers in a bathroom or a diaper-changing area and not at poolside.
- ✓ No swimming for someone who is sick, especially when they have diarrhea. They can spread germs in the water and make other people sick.
- ✓ (Ladies, it's fine with internal protection.)
- ✓ Swimsuit required? (Please consider your neighbors.)
- ✓ Bathing Cap required?
- ✓ No swimming alone?
- ✓ Noise level limit? (Please be kind to neighbors.)
- ✓ No running?
- ✓ No splashing?
- ✓ Ah yes! Have fun!

You are the final authority. It's your pool!

Happy Swimming!

About the Author

Al Curtis aka Ask the Pool Guy

Ask the Pool Guy was created in 2012 by Al Curtis (the inspiration), and Sandi Maki (the marketing guru), through a series of synchronistic events. Al had a knack for knowing swimming pools. Ever since his college days of his summer job with a local pool company, he lived, breathed, and dreamed swimming pools. In 2004, Sandi joined the pool company and began working on the brand for the future. Her desire to be online (before it was cool), began to shape the message within the company for amazing online success.

Al and Sandi believed that the philosophy of the company should be a fun approach to pools. Sure, the summer hours are long and hard, but with fun at every turn, it keeps the energy going. Customers began connecting on the website and cool photos of projects began showing up everywhere. It wasn't long before Al became the go in the local market for his unique construction of pools including the hybrid process that he has pioneered (www.LegendaryEscapes.com), and online with answers to questions about just about everything swimming pool. Ask the Pool Guy was born.

Today the Pool Guy travels the country in search of great new product ideas and innovation. He blogs, does video, and live sprecasts for the pool loving public. His sidekick Sandi also makes sure they stay on track with the latest web content. The online reach of Ask the Pool Guy continues to grow. Ask the Pool Guy and he will tell you the industry has come a long way since 1988, his early days in the business. Al has exciting plans for the future and is ready to spread new and interesting pool content into the online realm.

www.AskthePoolGuy.com