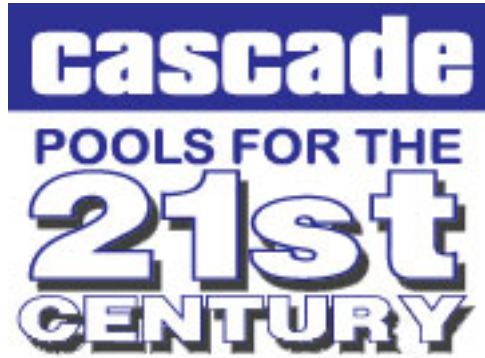


\$39.95
Inc GST



POOL OWNER'S MANUAL

*" How to look after your
CASCADE swimming pool -
without having to go to a
pool shop all the time "*



Important information!
Please find time to read this manual!
Keep handy to pool for reference

Vers. 01.03.2010

www.cascade.co.nz

CASCADE POOLS **0800 227 223**
ESTABLISHED 1971 **0800 CASCADE**

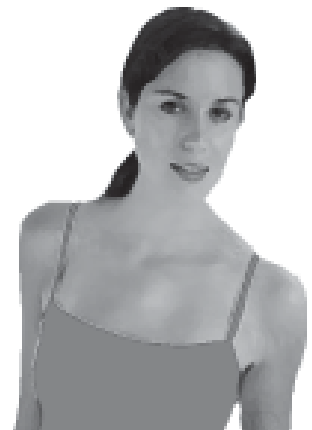
ALWAYS PERSONALLY SUPERVISE CHILDREN SIX AND UNDER!
Don't delegate child care to other children around swimming pools!

Contents

- 3 Pool Record (To be filled out by Cascade Representative)
- 4 Your pool WARRANTY: be sure to have this filled out & signed by a Cascade representative!
- 5 *"Make sure you get exactly what you want!"*
- 6 Electrical Requirements for Cascade Swimming Pools
- 7 QUICK START How to look after your Cascade Swimming Pool ... **be familiar with these basic principles!**
- 8 *"These are the only pool chemicals you need!"*
- 9 *"Open this box - these are important parts that need to be stored safely!"*
- 10 *"What to do when your pool is filled & is filtering!"*
- 11 *"Make sure you get a quote for the excavation - before they start!"*
- 12 Sally Says: *"The liner will cove over wall/floor joins - don't worry, it's normal!"*
- 13 Sally Says: *"Don't let the paving contractor block the Aquagenie Overflow"*
- 14 HOW TO USE YOUR "CHEMISTRY SET" TEST KIT!
- 15 5-in-1 test strips - because, We're all busy these days ...
- 16 Dip Strip instructions
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- 18 WINTERISING: COMPLETE INSTRUCTIONS
- 19 SPRING OPENING: COMPLETE INSTRUCTIONS
- 20 *"Construction Time is measured in working days on site"*
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- 22 *"Once the pool is filled & filtering, it's YOUR JOB to keep an eye on it"*
- 23 *"NEVER throw pool chemicals onto the pool liner - it may BLEACH and DAMAGE it!"*
- 24 Safety with Pool Chemicals
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- 30 Caring for your VINYL LINER
- 31 Pool Safety
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- 35 SAFETY WITH POOL CHEMICALS
- 36 Pool Terms dictionary (pages 36 - 43)

"Look for my helpful tips throughout this manual"

Sally Says:



"I will give you valuable advice and tips on how to look after your CASCADE swimming pool."
"For example, did you know you can SAVE MONEY by joining the Cascade Pool Owner's Club!"
"The on-line internet Pool Club means you can order all pool related chemicals and accessories, and pay only wholesale prices!"

"Symbols used in this manual:"
 ⓘ **"For your Information!"**
 ✕ **"Don't do this!"**

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Identify your pool and its components:

Pool:	The pool shape is	Rectangle Kidney Freeform
	The pool has	A Skimmer on the side Aquagenie - Skimmer Basket - Skimmer Flap - Chlorine Tab Cannister - Vacuum Plate - Water Feed Tube Other make of skimmer Water Returns at ends (Some models) Coping Stones around the top edge An Internal Mosaic Tile Band (Some models) Walk-out Steps (Some models) A Stainless Steel Ladder (Some models) Two Pool Lights (Some models)
Equipment:	Filtration	A Self-priming Pool Pump & motor - Hair & Lint Strainer with clear lid A Sand Filter - Multi-port valve on top - intake from Pump - discharge to Backwash - discharge to pool - to heater if fitted - to salt cell if fitted Chlorination Saline Chlorine Generator - Main Body plugged into mains voltage - Salt Cell low voltage plugged into main body Ozone Unit

It helps us to identify any problems if you can describe the components correctly.
 Purchase pool chemicals at discount prices: join the pool club www.cascade.co.nz

Your Pool Record

(To be filled out by Cascade Representative)

Pool Number _____ Blog ID _____

Pool Ordered on: _____ 20____ Installation: _____ 20____

Contract Total: \$ _____ Crew _____

Building Approval Issued (Date) _____ B/A Number _____

Original Owner(s) _____

Address: Street _____ Suburb _____

Dealership (Name) _____ or Cascade Central

ULTIMATE Standard Range Model _____ Shape _____

ULTIMATE DeLuxe Range Model _____ Shape _____

Size _____ x _____ Capacity _____, _____ liters

OZONE generator FM60 FM120 Aquagenie Yes Not fitted

Aquagenie Tabs Required _____ Summer _____ Winter (Note: It's less when OZONE fitted)

Filtration Hours 8 to 10 in Summer 4 to 6 in Spring/Autumn 2 to 3 during Winter

Filter FILTERMASTER F21/550 F25/650 Pump FX EURO 550w 750w

Skimmer AQUAGENIE OTHER _____

Heater Filtermaster FM14 FM21 Output Equiv _____ Kw

Liner ABGAL AQUATECH Aqualux .75 mm .50 mm Colour _____

Warranty Validation - See SWIMMING POOL WARRANTY section for equipment validation.

Note: Warranties will not be issued, nor will any completion or warranty work be undertaken by Cascade while payments remain outstanding.

WARRANTY ASSIGNMENT (New Owners)

1st Assigned (Date) _____ Assigned to: _____ Noted By _____

2nd Assigned (Date) _____ Assigned to: _____ Noted By _____

3rd Assigned (Date) _____ Assigned to: _____ Noted By _____

4th Assigned (Date) _____ Assigned to: _____ Noted By _____

"Lifetime Guarantee"

Cascade ULTIMATE components manufactured under license by Aquatech Industries Ltd are installed by Cascade Swimming Pools and/or its Authorised Dealers and Agents & Installers ("the seller") who are duly Certified to assemble and install for the end user ("the customer") the product known as the "Cascade Ultimate Concrete Swimming Pool" or the "Cascade Vinyl Liner Swimming Pool". We define the anticipated LIFETIME* of the components below:

Providing the components are installed by an Authorised Dealer in accordance with the provisions of the Building Approval issued by the Local Territorial Authority in accordance with the Plans and Specifications of the Designer and Registered Structural Engineer, and installed in geotechnically sound, stable non-acidic and well drained soils then subsequently maintained in accordance with the guidelines for correct chemical and sterilisation procedures contained in the supplied Pool Owner's Manual, the seller (in accordance with the provisions of the Consumer Guarantee Act 1992) warrants and guarantees the following components will perform to their expected lifetime *

TWENTY FIVE YEARS - ULTIMATE CONCRETE POOL SHELLS carry a twentyfive year structural suitability guarantee. Subsidence, Slips, Earthquake damage or Force Majeure are not covered by the structural guarantee

TWENTY YEARS - ULTIMATE WALL MODULES manufactured from zinc-electroplated steel will remain structurally sound and/or suitable for the intended use for a minimum period of twenty years

Electroplated Steel Wall Module Guarantees are voided if the pool is subsequently fitted with a Saline Chlorinator and/or installed in (known or unknown) acidic soil conditions, **unless a further treatment** of Polyester Powdercoating is undertaken by Cascade or its Agent prior to installation of the component.

TWENTY YEARS - ABGAL POOL LINER will remain free of defect and remain structurally intact for a period of 20 years. The warranty does not cover physical damage, piercing or cutting, inappropriate chemical treatment or abuse, fading or colour change, chemical wrinkling, low pH symptom, or any other effect resulting from mistreatment or causes beyond the control of the seller. (See "How to care for your liner" in the Owner's Manual)

TEN YEARS - POOL FILTER The pool filtration unit is unconditionally guaranteed against Manufacturing defect for 10 years providing that it is housed in such a manner as to be protected from weather & elements.

THREE YEARS - INTERIOR MOSAIC TILE BANDS, PLASTER FINISH SURFACES, WORKMANSHIP & INSTALLATION and pool edging stones carry three year workmanship guarantee and will remain free of non mechanical defect for a period of three years

TWO YEARS - POOL PUMPS are unconditionally guaranteed against Manufacturing Defect for TWO YEARS providing that it/they is/are housed in such a manner as to be protected from sunlight, inclement weather & other elements.

ONE YEAR - POOL LIGHTS, OZONE PLANT and Transformers are guaranteed for ONE YEAR. Light Bulbs carry no warranty, but will be replaced by us if they fail within ONE YEAR of installation. L.E.D. pool lights may carry additional manufacturer's warranty periods.



***The "Lifetime" of the components are defined as specified (above)**

THESE GUARANTEES MEET OR EXCEED YOUR RIGHTS UNDER THE CONSUMER GUARANTEES ACT

This Guarantee is issued & validated by the seller/installer. Should a claim arise, under the terms of the Consumer Guarantee Act, you must contact the seller/installer for advice. Be aware that any guarantee is limited to workmanship & mechanical defect and not "wear & tear". The Guarantee period commences on the date of receipt of the final payment due, and will not be validated while any payments are outstanding

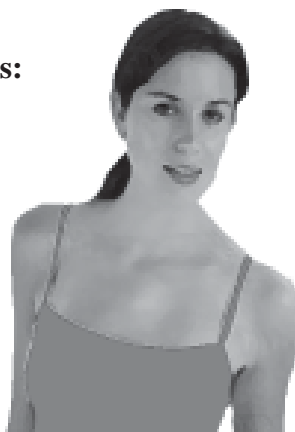
Installation Validated By: _____

Signed _____

Being a duly Authorised Agent of Cascade Swimming Pools

Date _____

Sally Says:



"Make sure you
get exactly what
you want!"

*WE HAVE EXCAVATED THE POOL TO THE
DEPTH AND SHAPE YOU ASKED FOR!*

*PLEASE BE ON SITE WHEN THE
CONCRETE IS PLACED
TO ENSURE THE TEAM PRODUCE
THE FINISHED SHAPE AND DEPTH
YOU EXPECTED!*

*YOU HAVE AGREED TO CHECK THAT THIS PHASE OF
THE POOL MEETS YOUR EXPECTATIONS!*

*IT'S ONLY GOING TO TAKE A COUPLE OF HOURS TO
PLASTER THE POOL FLOOR, AND YOU HAVE AGREED TO
TAKE THE TIME TO ATTEND THIS PHASE TO ENSURE
THE TEAM DOES EXACTLY WHAT YOU WANT!*

*Once the concrete has set, we cannot readily make any
changes, so any modifications you want will have to be
charged to your account - so be sure, rather than sorry.*

ELECTRICAL REQUIREMENTS for CASCADE SWIMMING POOLS

All electrical connections must be enclosed against weather, unless they are in a shed or under the house.

Filtration Pump

The pool filtration is powered by a 240 volt electric pump. The pump motor size may vary in power requirements depending on the pool size and/or water capacity. In larger pools two pumps/filters may be installed. The pump(s) require a standard 3 pin outlet. All outdoor 3-pin-plugs should be of the "weatherproof" type and housed in a weatherproof box.

Medium size pools	up to	45 kilolitres		1 x 550 watt ECO PUMP Motor
Large size pools		45 kl & up to	80 kl	1 x 750 watt ECO Pump Motors
Larger pools		80 kl & up to	120 kl	2 x 550 watt ECO Pump Motors
Much Larger pools	over	120 kl		2 x 750 watt ECO Pump Motors

Time Clock

A hard-wire filtration timer clock is included with your Cascade pool for each filter system supplied, and **you will want a bypass fitted** for pool vacuuming during "power off" times, so ask the Electrician about fitting one for each time clock. The time clock feeds the 3 pin outlet that the pool pump(s) are plugged into.

OzoneGenerator

A Fluorescent OZONE generator uses only 35w and so will plug into a handy 3-pin power point.

Pool Lights

QH: Normal family size pools usually have a pair of QH (Quartz Halogen) lights, and they include a "240v to 12v" transformers housed in drip-proof zone 3 plastic moulded boxes for each light. QH lights are either 100 or 150 watts and come with ten meters of cable. If the cable length is altered, lights may not function as intended due to voltage variation. The Electrician will calculate wire gauge should any addition be required, which will be at your cost.

L.E.D. Light Emitting Diode lights use less power and up to six can run off one transformer. No electrical current goes near the pool as the light is carried through a special People like to **switch the pool lights on and off from inside their house**, so inform the Electrician if you want to do this.

Heat Pumps

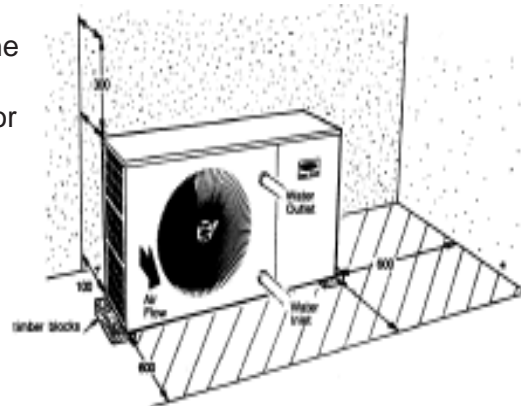
Heat pumps vary in power requirements depending on the model, it is usual to hardwire the Heat Pump into the electrical supply. Here are the values for typical Filtermaster and AquaCal units:

Mfg	Model	Volts	Noml output	Kw Input	Run Amps/	Fuse/Amps
Filtermaster	FM155	220-240	6/10 Kw	1.2	6.0	15
Filtermaster	FM14	220-240	10/16Kw	1.2	6.0	15
Filtermaster	FM21	220-240	18/23Kw	2.2	9.6	25
Filtermaster	FM350	220-240	18/25Kw	2.4	16.0	30

The heat pump is interlocked to a water pressure switch which prevents operation when water flow is too low or nonexistent, or when the pool is being backwashed.

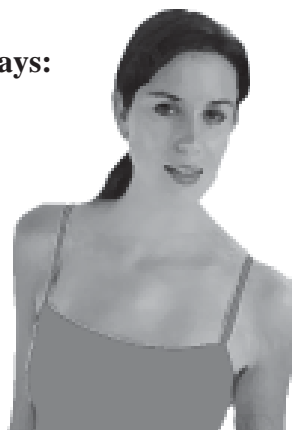
To avoid re-circulating exhausted (cold) air back into the intake side, the intake and exhaust sides of the heat pump must be separated by ducting or the unit must be installed open air without physical barrier or restriction to air flows.

If the heat pump is to be installed inside a shed or closed room, care must be taken to ensure a steady flow of intake air via a grill or vent, and the cold exhaust vented out to avoid being drawn back into the intake side of the unit.



QUICK START

Sally Says:



“A Balanced pool will look after itself!”

If nothing else ...
be familiar with these basic principles!

It's SIMPLE to care for your

CASCADE Ultimate swimming pool fitted with OZONE generator!

1. Keep pH at 7.6 (See NOTE 1. Below)
2. Keep Very Low Chlorine Residual (See NOTE 2. Below)
3. Keep the Calcium Hardness at 200 ppm (See NOTE 3. Below)
4. Keep the Total Alkalinity at 120 ppm*
5. Periodically superchlorinate with Cal Hypo*

Note 1. pH is like the Richter (Earthquake) Scale : Each point is TEN TIMES the previous.

Note 2. When OZONE is installed, the chlorine residual may be .50 or less and not even show up on your test strip or Test Kit reading. A visual check for Algae (the pool will start to go green) means you need a few more Tabs in the Aquagenie. If it's not green, don't!

Note 3. The Calcium Hardness and Total Alkalinity work together - so the ratio must be maintained. If you have a higher TA, you need a lower CH etc. Stick to these values!

Note 4. Superchlorination means putting a coffee cup sized dose of calcium Hypo-chloride (Granular Chlorine) into the skimmer (while the filter is running) every two or three weeks - or when the pool looks “poorly” ... to “burn out” any stubborn bad stuff!

Taylor Watergram		
TOTAL ALKALINITY	Ph	CALCIUM HARDNESS
50	8.4	50
60		60
70	8.2	70
80		80
90	8.0	90
100		100
125	7.8	125
150		150
175	7.4	175
200		200
250	7.2	250
300		300
350	7.0	350
400		400
450	6.8	450

The table includes a shaded diagonal band labeled 'IDEAL RANGE' between pH 7.4 and 7.8. Two lines are drawn across the table: an 'upper limit' line at approximately pH 8.0 and a 'lower limit' line at approximately pH 7.2.

**Your pool is
BALANCED
if the Taylor
values are true!**

**(The Ozone & Aquagenie
will do most of this for you!)**



Sally Says...



“Some pool shops may try to sell you more than you actually need! If you have a Chlorine pool - these are all you will need”

These pool chemicals may be needed to keep your pool in top shape.

- Aquagenie Tabs* (Tri-iso-cyanurate) Keep recommended number of TABS in the skimmer cannister to keep your pool healthy & safe. Check pool water weekly in summer. Use only the correct 1” (25mm) tabs available from Aquatech.
- pH Increase* (Sodium Bicarbonate aka Soda Ash) Check pH monthly, add pH Increase if pool pH is below recommended range of 7.6 - being ideal
- pH Decrease* (Sodium Bisulphate) Check pH monthly, add pH Decrease if pH is higher than recommended range of 7.6 - being ideal
- Calcium Chloride* Check Water Hardness at beginning and middle of swimming season. Add calcium chloride if Hardness is substantially lower than 200ppm
- Granular Chlorine* Superchlorinate to 3 - 4 ppm every 7 to 10 days in swim season when pool use is greatest. Tip chlorine directly into skimmer while pump is running.
- Total Alkalinity* Maintain TA at 120ppm. Raise with Sodium Bicarbonate (aka Neutraliser or Soda Ash), lower with Sodium Bi Sulphate (Dry Acid)
- Stabiliser* (Cyanuric Acid) A level of 50ppm to 100ppm (max) is desirable to counter the effects of sunlight dissipation of pool chlorine. 1kg per 20,000l will achieve this level. A ny pool shop will test for cyanuric acid levels.
- Algaecide* (Copper Salts/Benzyl Ammonium Chloride) “Weedkiller” will inhibit the growth of algae in your pool and save on chlorine. 1 liter per 50,000l initially in spring, then 10 ml per month thereafter until you close the pool.

Use only Cascade Recommended Pool Chemicals - from Aquatech Look for the Label. Purchase on-line from the Cascade pool club or direct from Aquatech Industries Limited (09) 636 9921 email info@aquatech.co.nz



Sally Says:



“Check the contents of the Handover Kit!”

THE POOL KIT DELIVERED TO YOU INCLUDES A SEALED BOX WITH A LABEL WHICH SAYS:

“GIVE THIS TO THE CUSTOMER”

OPEN IT

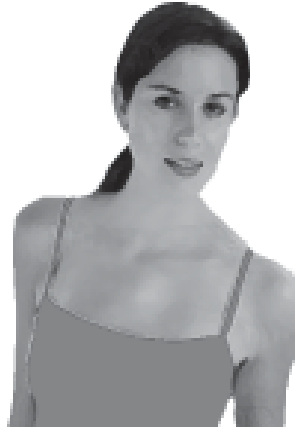
CHECK THE CONTENTS AND STORE THEM IN A SAFE PLACE!

These Items are small and expensive, such as Transformers for the pool lights, Deck Equipment, an Electronic Time Clock and other important items that can easily be lost or misplaced!

KEEP THESE ITEMS IN A SAFE PLACE UNTIL THE INSTALLATION CREW ASKS FOR THEM!

If any items are lost or misplaced you may be charged for a replacement!

Sally Says:



“DON'T leave your THERMAL cover on all winter - the warmth generated will encourage ALGAE to grow in the pool”

IMPORTANT NOTICE!

POOL COVER

IF YOU HAVE A THERMAL POOL COVER FITTED TO YOUR POOL, DON'T LEAVE IT ON THE POOL ALL WINTER!

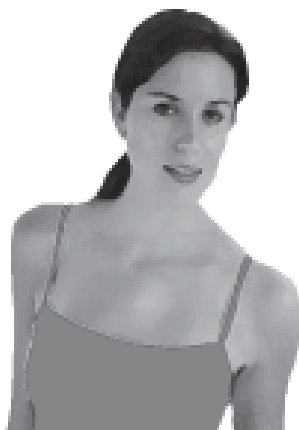
A Thermal cover is intended for use in conjunction with your pool heater or as a solar temperature booster when it's sunny. This is usually SPRING & AUTUMN!

If you leave a thermal cover on all winter, you could face a \$500 bill for spring cleaning up the the pool and getting rid of ALGAE that has grown merrily all winter!

The Pool Cover & Roller may take up to four weeks after the pool is finished to be made and installed.

We will Balance the pool for you initially, but it changes with time as rainfall bringing in airborne pollution, and needs maintenance when the pool is new or being commissioned each spring. All the information you need is available in this manual and the Pool Club web site www.cascade.co.nz (Look for the "Private Areas" tab on the Cascade web page). The password to enter the Pool Club is "poolclubmember" (lower case, no quote marks). As well as the written information, we will give you a one-on-one training session (or as many as you need). Don't be afraid to ask for help - pool water chemistry is not an easy subject to master, but we will do our best to make it as understandable and simple as we can!

Sally Says:



"Sometimes unavoidable extras crop up during the excavation!"

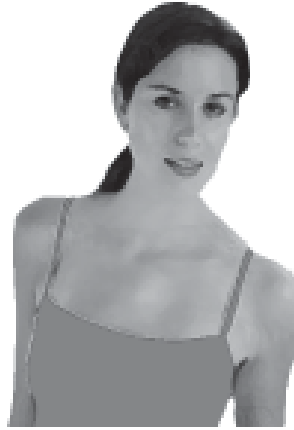
IMPORTANT NOTICE!

Our Contract Price DOES NOT INCLUDE any extras generated by excavation rebuilds due to less than perfect excavation (for any reason) and you are liable for materials and labour to infill voids etc.

Discuss this with our supervisor so you are fully aware of your financial liability.

Sometimes (especially in rocky terrain) we have to bring in loads of hard fill and even cement to stabilise the excavation. Your pool site is termed "Undiscovered Country" until we dig it out.

Sally Says:



"The AQUALUX interior is tough & robust and will cove into shape!"

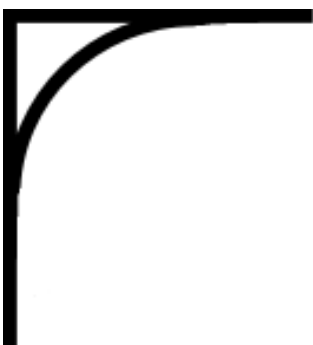
FOR YOUR INFORMATION!

Our ULTIMATE POOL is a robust high-density concrete pool with a long-lasting flexible interior that is very tough & durable!

The liner will be a tight fit wherever it touches the hard surface of the pool. Where there are right angles between vertical wall to floor and in the corners, the material will form a slight coved shape. This cove is tough & durable .

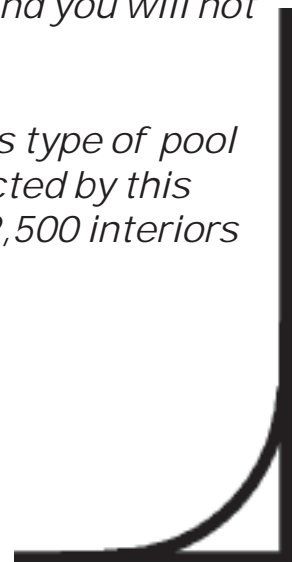
This is normal and is not going to be vulnerable to puncture by toe-nails or any normal use of the swimming pool. This may also be noticed at the corners of rectangle pools. This is a feature of the Aqualux interior pools, and you will not damage the liner by standing on the coved area.

The illustrations below give you an idea of what is normal for this type of pool interior. The Guarantee of the liner is not affected by this feature, and in the installation of more than 12,500 interiors has never proved to be a problem!

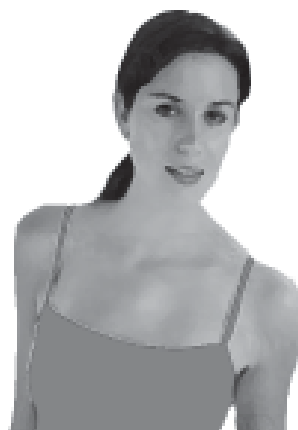


< Corner

Wall to Floor junction >



Sally Says:



“Don't block
the pool over-
flow!”

AQUAGENIE SKIMMERS have a built-in overflow which prevents the chlorine cannister being flooded

**When you have your concrete surrounds
installed be sure that this is not blocked!**

**In winter the pool might overflow if the overflow is
blocked off. This releases concentrated chlorinated wa-
ter out of the skimmer front, which may bleach and/or
damage the pool liner!**

**YOU NEVER HAVE TO LOWER THE POOL DOWN IF IT
FILLS UP WITH RAINWATER - SO DON'T BLOCK
THE OVERFLOW!**

**If you don't understand what this means,
call 0800 CASCADE for a full explanation!**

READ AND UNDERSTAND THIS PAGE

YOU WILL NEED TO - TO KEEP YOUR NEW POOL SAFE & CLEAN

IF YOU NEED MORE POOL CHEMICALS, CALL US! 0800 227 223



HOW TO USE YOUR "CHEMISTRY SET" TEST KIT!

We encourage you to keep the Total Alkalinity & Calcium Hardness levels up in your pool - even if you dissolve powder chlorine in a bucket, tip all the resulting mixture (residue and all) into the skimmer while the pool is running. If you don't have a 5-in-1 test kit (The Blue one) you may need a local pool shop to test for calcium hardness - which should be between 200 and 400 ppm. We supply the 5-in-1 when available, but as an imported item, sometimes they are not available. Follow these instructions

Mk IV Swimming Pool Water Comparator Test Kit Model 0302



Recommended Levels for vinyl liner swimming pools

1. Free Chlorine Residual 1.0 to 2.0 (.5 TO .75 IF OZONE FITTED)
2. pH of 7.6 to 7.8 (Maximum)
3. Total Alkalinity 120 to 150
4. Calcium Hardness 200 to 300

Raise Value with:

- Granular or Liquid Chlorine
- Soda Ash
- Sodium Bicarbonate
- Calcium Chloride

Lower Value with:

- Time will dissipate levels
- Sodium Bisulphate
- Sodium Bisulphate
- Add Water to pool

Refer to supplier's container for instructions and quantities to use

1. CHLORINE TEST

1. Fill small tube (left side) to top mark with pool water to be tested.
2. Add DPD tablet.
3. Compare colour with example using Cl side. The other sample is for Bromine testing.

SHOCK DOSING
Shock Dose as required with 5 to 10 ppm each 7 to 10 days in summer. Higher values may damage liner or bleach printed patterns.

2. pH TEST

1. Fill large tube (right side) to top mark with pool water to be tested.
2. Add 1 drop No 4 to neutralise chlorine and avoid bleaching sample.
3. Add 5 drops No 2 and swirl to mix thoroughly.
3. Compare colour with example. See recommended levels (above).

NOTE:
If result is above 7.8 save sample for ACID DEMAND test. See next box for details on how to determine acid demand.

ACID DEMAND (TO LOWER pH)

1. Use water in tube from pH test.
2. Add No 3 drop by drop (swirl between drops) until colour matches 7.6 value on comparator.
3. Count drops.
4. Each drop = 500g of pH Decrease per 40 kl of pool water to reduce.

WARNING!
Avoid the use of any liquid acids (Hydrochloric or Muriatic Acid) to lower pH! To avoid personal injury or equipment damage, use dry acid (Sodium Bisulphate).

3. TOTAL ALKALINITY

1. Rinse large tube (right side) and add pool water to lower mark.
2. Add 1 drop No 4 to neutralise chlorine then 2 drops No 5 and swirl to mix thoroughly.
3. Add No 3 drop by drop (swirl in between) until colour changes from purple to clear or yellowish. Count drops.
4. Each drop = 10 ppm

4. CALCIUM HARDNESS

1. Fill test tube to lower mark with pool water to be tested.
2. Add 2 drops of Hardness Solution No 1 and swirl to mix. Sample will turn Violet colour if hardness is present
3. Add Hardness Solution No 2 drop by drop and swirl to mix until colour changes to permanent blue.
4. Each drop = 50 ppm.

If you have an OZONE UNIT fitted, THE RESIDUAL CHLORINE should be between .5 and .75 AND MAY NOT READ ON THIS TEST KIT. Just check and ensure that there are 4 - 6 TABS in the aquagenie, and it is flowing into the skimmer, and the pool water is nice and CLEAR!

GENERAL INFORMATION

NYLEX Liners should typically give 20 years of service in your pool when all chemical values and water treatment instructions are adhered to. To enjoy prolonged liner life, avoid overchlorination, improper water balance and physical damage. Understand the recommendations below so that you become familiar with the correct procedures in maintaining your swimming pool liner. A properly cared-for vinyl liner should equal - or better - most other pool interior surfaces.

POOL WATER BALANCE

1. Maintain "Free Available" Chlorine (FAC) in 1.0 to 2.0 range. Compare result within 30 seconds after you add DPD tab to water sample. "Combined Chlorines" will also develop red colour in DPD sample within 2-3 minutes and give a false impression of FAC. "Breakpoint" chlorination neutralises contaminants, "Residual" chlorine goes one step further - to protect against on-going contamination. Maintain a residual!

Combined chlorines (Chloramines) do not contribute to pool sterilisation, and smell like rotten eggs (the so-called "chlorine smell") this means you have insufficient chlorine to combat contaminants in the pool. Increase chlorine levels, or shock dose accordingly to eliminate chloramines. Check FAC weekly in summer months.

2. Maintain pH at 7.6 - 7.8 max. pH is a very important aspect of pool balance, as an "out of range" pH can lock up the chlorine, and a low pH may damage to pool fittings and liner. If pH test indicates adjustment is needed, check the TA first. Check weekly.

3. Total Alkalinity (TA) exceeding 120 ppm but not exceeding 150 ppm to combat "pH Bounce" and supply a "buffer" against rapid changes in pH. Bringing TA to correct range may correct other values. Adjust pH last. Check TA monthly.

4. Calcium Hardness should be maintained at greater than 200 ppm but not more than 400 ppm at which level the pool may develop cloudy water. Water "tries" to gain hardness, and most of NZ's water originates from rainfall - which has low or zero hardness. Check annually in spring.

HELPFUL HINTS

Avoid using liquid acid (Hydrochloric, Muriatic) to lower pH, as it may splash and damage your clothes, or injure you. If you must use it, adopt safety rules and wear eye protection and gloves. Dry Acid (Sodium Bisulphate) is easier and safer to use.

Never EVER mix chemicals together - either in a bucket, dispenser, or in the Aquagenie canister. EXPLOSION and INJURY may follow!

We do not recommend the use of salt chlorinators, because it's too easy to "turn up the volume" and consistently produce chlorine levels in excess of 3.0 ppm - which will ultimately bleach (and destroy) the pool liner. If you have a salt chlorinator, be sure to monitor the chlorine production, run a reduced calcium hardness level of 100 to 150 ppm, and monitor for sodium hydroxide buildup (Sod Hydroxide has pH of 14)

Always run the pool filter when adding chemicals, and NEVER add ANY chemicals straight into the pool water (despite what instructions on the packet may tell you!) Add into water flow in skimmer, and run filtration for at least two hours afterwards.

Aquagenies and Trichloroisocyanuric acid feeder tabs contain Cyanuric Acid and will lower the pH, Chloride & TA levels eventually. Monitor levels and adjust accordingly. Cyanuric Acid levels should not exceed 150 ppm (to avoid cyanuric lock) but this will take several seasons to develop, and is counteracted by substantial rainfall typical of NZ. Cyanuric Acid test strips are available from us. Call (09) 636 9921 for details. We do not perform Water tests at our factory and advice is limited to printed matter

NOTE: THESE STRIPS ARE NOT AS ACCURATE AS THE TEST KIT - USE FOR COMPARISON ONLY!

5-in-1 test strips - because, We're all busy these days ...

The 5-in-1 test strip is the answer to busy people. **No longer do you have to:**



- ✗ Go to pool and get a water sample
- ✗ Sit down and gently pour the water into the testing container
- ✗ Add one chemical ...
- ✗ Then another ...
- ✗ Shake the solution ...
- ✗ Compare the result with chart

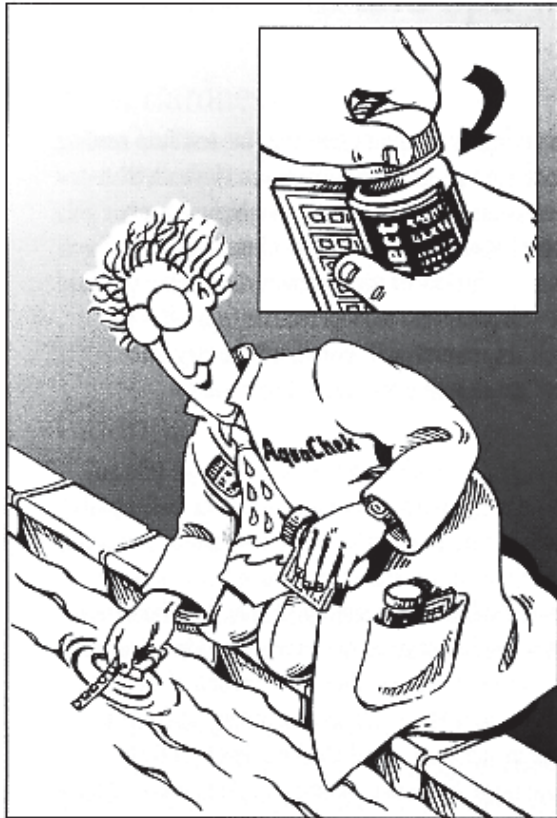
Now, with the 5-in-1 test strip it's a whole new ball game.

Simply dip a strip into the pool, and you're almost done! hold the strip level with the comparator, and that's it!

A Quick and simple way to check your pool's health.

Note: test Strips are NOT as accurate as the "Chemistry Set". Use for comparative testig only, once you have established a bench mark. Also, they gte "past dated". Check the botom of the container for USE BY date.

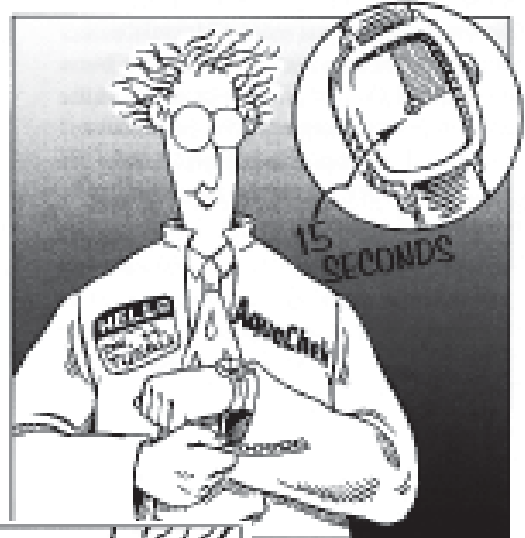




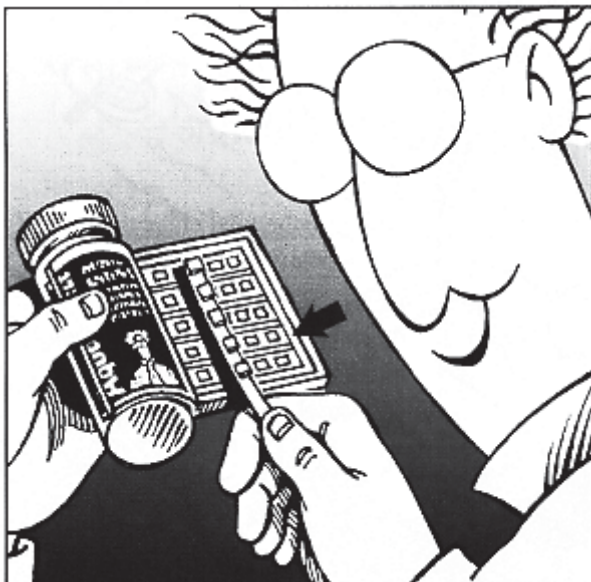
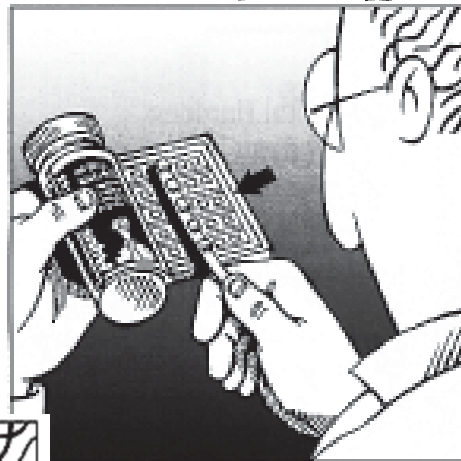
Dip the Strip, then



Hold flat for 15 seconds.....



Compare colors to sample



Log the results!



Easy, isn't it!
Remember that the recommendations in the US AquaChek manual may differ from ours. **Use ours!**



The FIVE STEP PLAN to
WINTERISING
your Cascade Swimming Pool!

WINTERISING: COMPLETE INSTRUCTIONS

Give pool a good vacuum then backwash the filter for 3 to 4 minutes or until the backwash discharge is clean and clear. Reduce the daily filtration time to 2 to 4 hours depending on whether your pool is less than 30kl or more than 30kl. For pool >100kl set timer for 8 hours. Reduce Chlorine tabs to 4 - 6 per Aquagenie skimmer. Add 1 litre Algaecide (HOTZONE is one) for all pools up to 50kl, 2 liters for larger pools. (Repeat this in 6 weeks time). Using the "Chemistry Set" (not the test strips) water test kit, check the pool balance and ensure the levels are correct for calcium hardness of 200ppm and total alkalinity of 100ppm. If they need to be adjusted, re-check after adding Calcium Chloride and/or Sodium BiCarbonate, and adjust the pH as required to maintain a level of 7.6. Superchlorinate the pool to 5.0 ppm of residual chlorine (test chlorine levels again after four hours). Remove the Pool Cover as Algae will form underneath during winter and a chlorine buildup with no sunlight exposure could damage the pool liner. Turn off the Heat Pump at the main switch,

Every few weeks glance at the pool to see if any algae is forming. If there is, repeat the instructions for using Algaecide (above).

If there is a chance the pool might freeze over, throw a few beach balls in for the winter (The water won't freeze under them, and the hole under them will allow the frozen water to expand without damaging the pool).

USE ONLY CASCADE CERTIFIED POOL CHEMICALS!

Order direct from the PoolClub Site! Pool Chemicals at Wholesale Prices!

Don't worry about lowering your pool water when it fills with rainwater. Aquagenie pools have a self-adjusting level and need no intervention from you. Non-Aquagenie pools may "overflow" without any problem, and both will overflow into the pool drainage we installed when building your pool, so it is not necessary to manually lower the pool.

THE QUICK VERSION of the FIVE STEP PLAN:

1. Backwash the filter thoroughly, being careful not to lower the pool too far.
2. Reset your time clock to 2 to 4 hours daily depending on your pool size and water capacity.
3. Reduce the Quadrachlor tablets in the Aquagenie Canister to 3 to 4, add 1 litre of Algaecide per 50 KI of pool water into skimmer while pool is operational, superchlorinate to 5.0ppm, balance pool, making sure correcting the pH is the last thing you do.
4. Remove the pool cover and store it for winter.
5. Switch off the Heat pump or Gas Heater off at the wall.

CALL US (0800) 227 223 IF YOU HAVE ANY QUESTIONS!

DON'T LOWER YOUR POOL DOWN IF IT FILLS WITH RAINWATER - LET THE AUTOMATIC SYSTEM DO THIS FOR YOU. FAILURE TO NOTE THIS DETAIL COULD CAUSE A PROBLEM WITH THE LINER!



The FIVE STEP PLAN to
SPRING OPENING
your Cascade Swimming Pool!

SPRING OPENING: COMPLETE INSTRUCTIONS

Backwash the pool filter thoroughly for 3 - 5 minutes (don't lower the pool too far!) Increase Filtration time, initially to 6 - 8 hours, then 10 to 12 hours in the height of summer (experiment!). Increase Chlorine levels by adding 8 to 10 Aquagenie Tabs into skimmer cannister, Add 1 liter of Algaecide per 50kl pool water, Water may turn bright blue or green initially. Repeat in one month's time and each month add 500ml top up. As brands may have different instructions, read the label on the bottle and follow the instructions. Balance pool water by adding Calcium Chloride hardness to 200ppm and Total Alkalinity by adding sodium BiCarbonate to 100ppm and pH UP or pH DOWN (as needed). Adjust the pH LAST! Install the Pool Cover and Switch on the Heat Pump. It is a heat retention cover, and leaving it off in the initial stages will delay the pool heating up to your required temperature. Run the pool filtration system 24/7 on time clock override if possible, to bring the pool water up to the required temperature. Heat Pumps are "maintance heaters" and will take a full week to reach optimum pool temperature.

The QUICKSTART 1-2-3-4 section of the Pool Owner's Manual supplied with each new Cascade pool installation will show you how to correctly maintain the correct Pool Water Balance values, and we have given you a Quick Start 'fridge magnet. If you don't have a Quickstart Fridge Magnet, we will mail you one. Call (0800) CASCADE and ask for one!

USE ONLY CASCADE CERTIFIED POOL CHEMICALS!

Order direct from the PoolClub Site! Pool Chemicals at Wholesale Prices!

Don't worry about lowering your pool water when it fills with spring rainwater. Aquagenie pools have a self-adjusting level and need no intervention from you. Non-Aquagenie pools may "overflow" without any problem, and both will overflow into the pool drainage we installed when building your pool, so it is not necessary to manually lower the pool.

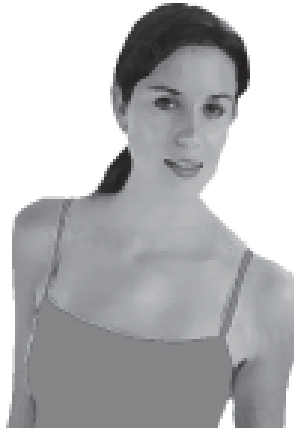
Every few weeks glance at the pool to see if any algae is forming. If there is, repeat the instructions for using Algaecide (above).

THE QUICK VERSION of the FIVE STEP PLAN:

1. Backwash the filter thoroughly, then reset your time clock to 6 to 8 hours.
2. Increase the Quadrachlor tablets in the Aquagenie Cannister to 8 to 10 to maintain a residual chlorine level of 1.0ppm to 2.0 ppm.
3. Add 1 litre of Algaecide per 50 Kl of pool water, dumped into skimmer while pool is operational.
4. Replace the pool cover when you start the heat pump.
5. Switch on the Heat pump or Gas Heater at the wall.

CALL US (0800) 227 223 IF YOU HAVE ANY QUESTIONS!

Sally Says:



"10 day construction does NOT mean 10 consecutive days!"

*POOL CONSTRUCTION TIME IS
MEASURED IN "WORKING DAYS"*

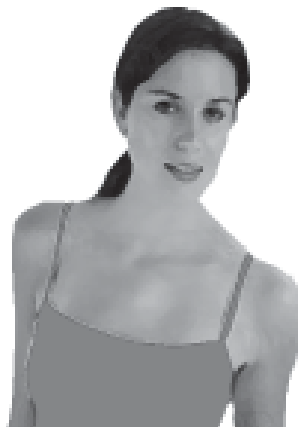
*WE ASSUME MOST OF OUR POOLS
WILL BE CONSTRUCTED WITHIN
TWENTY WORKING DAYS*

BUT!

*... THESE DAYS WILL NOT BE
CONSECUTIVE DUE TO MATERIAL
DELAYS, WEATHER, OTHER TRADES
AND OTHER CAUSES BEYOND OUR
CONTROL*

*FOR THIS REASON WE CANNOT AND DO NOT GUARANTEE
ANY START OR COMPLETION DATES OR LENGTH OF
CONSTRUCTION TIME!*

Sally Says:



“You pay for the swimming pool excavation & soil removal!”

REMEMBER - YOU ARE PAYING

*FOR EXCAVATION & REMOVAL OF SOIL
FROM THE POOL SITE TO THE TRUCKS,
TRANSPORTATION TO THE TIP,
and often even TIP FEES!*

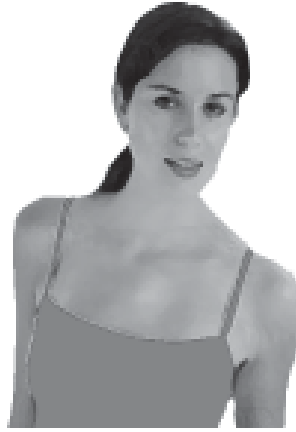
*ASK THE EXCAVATION CONTRACTOR FOR AN INDICATION
OF COSTS BEFORE HE STARTS - REMEMBERING THAT SOIL
REMOVAL COSTS MAY EXCEED \$3,500 PER DAY or more!*

*keep a track of the digger & truck hours - it's in your inter-
ests to know what you are paying for!*

*Getting stuck in traffic is a major urban problem, increases
chargeable truck hours, so soil removal costs more!*

ASK THEM FOR A FIRM QUOTE!

Sally Says:



“Don't let other trades damage your new pool!”

IMPORTANT NOTICE!

*ONCE YOUR POOL IS
“FILLED & FILTERING”*

IT'S

YOUR

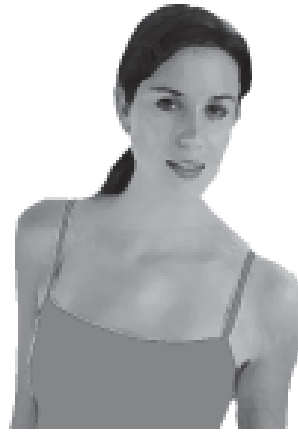
*JOB TO KEEP THE POOL
CLEAN AND SAFE FROM OTHER
CONTRACTOR'S RUBBISH AND
DEBRIS*

IF WE HAVE TO MAKE SEVERAL TRIPS TO CLEAN THE POOL DUE TO YOUR LANDSCAPERS OR PAVERS CON-
CRETE SAWDUST OR DROPPING MUD & RUBBISH INTO THE POOL, THIS WILL NOT BE A FREE SERVICE, AND
INVOICES WILL FOLLOW.

ENSURE THAT “OTHER TRADES” DO NOT CONTAMINATE YOUR NEW SWIMMING POOL - APART FROM THE
DAMAGE THAT MAY OCCUR FROM THEM DROPPING STONES, ROCKS, BRICKS, TIMBER ETC THAT MAY DAMAGE
OR STAIN THE POOL INTERIOR

ANY ENSUING DAMAGE IS NOT COVERED BY YOUR WARRANTY!

Sally Says:



“Don't think
your pool is
leaking if the
level drops”

IS MY POOL LEAKING?

*AN UNCOVERED POOL CAN DROP
25mm (1") OR MORE EVERY DAY!*

*Sunny days cause evaporation,
windy days cause transpiration!
Sunny, Windy days are the worst!
Water features & infinity edges!*

*ALL WILL CAUSE THE POOL LEVEL
TO DROP!*

YOUR POOL IS NOT "LEAKING"

Fortunately water is cheap!

(Metro Water Auckland \$1.60 per 1,000 liters - March 2010)

Sally Says:



"NEVER throw
Pool Chemicals
directly into the
pool water!"

NEVER

*THROW ANY POOL CHEMICALS
DIRECTLY INTO THE POOL !*

*Chlorine is a Bleach, and
will fade the print pattern, damage
the surface and shorten the life
of the
Aqualux interior.*

*Add all pool chemicals into the skimmer while the filtration
is running and disregard any pool chemical instructions that
tells you to broadcast chemicals into the pool!*

*USE ONLY CASCADE CERTIFIED POOL CHEMICALS
Available from Aquatech Limited (09) 636 9921
and the pool owner's club.*

NEVER MIX POOL CHEMICALS TOGETHER!

SAFETY WITH POOL CHEMICALS

Pool chemicals can be injurious and damaging if not handled correctly and in particular if not kept out of the reach of children. It is very important to familiarize yourself with the following guidelines.

- a. never mix any pool chemicals together, not even different types or brands, particularly granular chlorine.
- b. Never use pool chemicals in conjunction with household cleaners and detergents.
- c. Never roll or violently agitate containers of granular chlorine. Always keep them tightly closed and away from naked flame. Failure to observe these simple precautions can lead to fire, explosion or the production of poisonous gases.
- d. Keep all chemicals in a locked dry area out of reach of children. Always use clean dry utensils for measuring pool chemicals. Note: it is recommended practice to reserve a measuring device specifically for each type of chemical.
- e. When adding chemical and water solutions to the pool do so carefully holding the liquid container close to the surface of the pool to avoid splashing skin or clothing.
- f. Always wash hands thoroughly with soap and water after using all chemicals.
- g. All acids should be handled with great care. Always add acid to water NEVER water to acid.
- h. Always check labels thoroughly before use. Similar looking labels can lead to the use of the wrong chemical with resultant harmful conditions.
- i. Change test kit reagents every 12 months or sooner. The use of old reagents can lead to inaccurate tests and wrong dosages.
- j. Familiarize your family with antidote treatment and first aid procedures in case of chemical accidents. Some first aid procedures are mentioned elsewhere in this booklet.

Remember that pool chemicals when treated with respect are beneficial products, which will ensure healthy water conditions and the health and safety of swimmers.

DONT'S

✘ NEVER MIX ANY TWO DIFFERENT POOL CHEMICALS - EXPLOSION AND SEVERE BURN INJURY WILL RESULT!

✘ DO NOT ADD ANY CHEMICALS DIRECTLY INTO THE SWIMMING POOL!

- LINER DAMAGE OR PATTERN BLEACHING MAY OCCUR!
- YOUR LINER WARRANTY WILL BE INVALIDATED!

✘ DO NOT PUT TRI-CHLOR TABS DIRECTLY IN YOUR SKIMMER BASKET!

✘ DO NOT ALLOW OVERCHLORINATION WITH POOL COVER ON POOL!

- LINER DAMAGE OR PATTERN BLEACHING MAY OCCUR!
- YOUR LINER WARRANTY WILL BE INVALIDATED!

✘ DO NOT STORE POOL CHEMICALS NEAR PETROLEUM BASED PRODUCTS

✘ DO NOT SMOKE, OR ALLOW FLAME OR FIRE IN THE VICINITY OF CHEMICALS

✘ DO NOT STORE POOL CHEMICALS WHERE CHILDREN MAY ACCESS THEM!

YOUR POOL FILTRATION SYSTEM

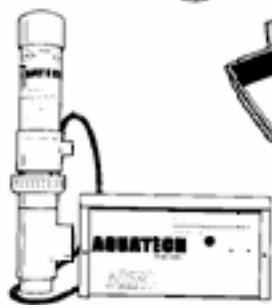
Your filter system is chosen with great care from a reputable manufacturer and is of the high rate sand type. The water is cleansed by the filtration process known as consecutive dilution. Water is drawn by the pump from the skimmer, through a hair and lint catcher and is then forced by the pump through the filter tank from which it is returned to the pool free of suspended material.



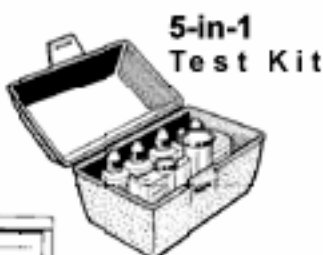
Hi-Rate Sand Filter



Pool Brush



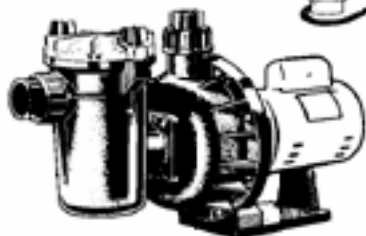
Salt Chlorinator



5-in-1 Test Kit



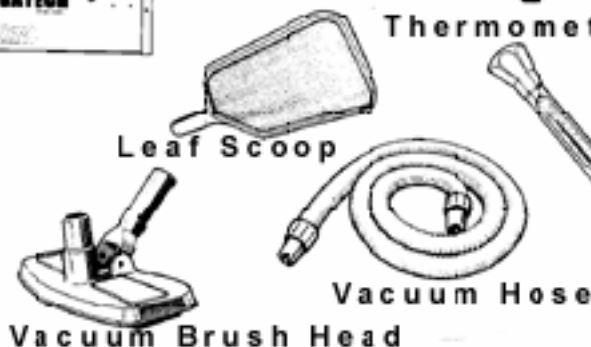
Pool Lights



Pool Pump



Thermometer



Leaf Scoop

Vacuum Hose

Vacuum Brush Head

This process is continuous and is in no way selective. In practice, clean water is continually poured into dirty water, as the dilution continues, the water is cleared of suspended impurities. As the filter works to clear the water more debris is added to the pool via bathers, wind, insects etc. therefore the filter must be operated on a regular basis, preferably with a time-switch control

(Supplied with the pool kit). Gradually a balance will be attained between the dirt being added to the pool and that which is filtered out and the pool water will sparkle - obviously clean.

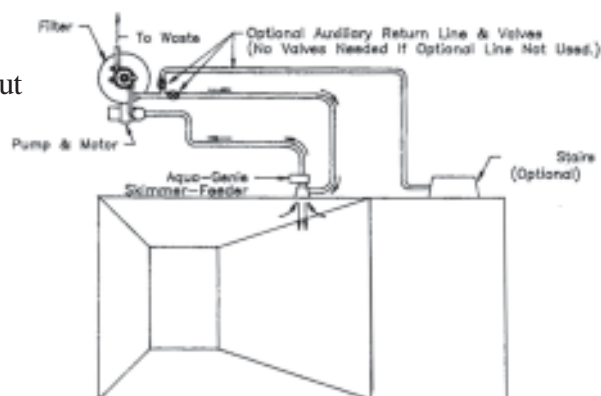
THE FILTRATION CYCLE

Water passes over the skimmer weir trap, a hinged floating flap, which adjusts to slight varying water levels, caused by heavy rains, evaporation, backwashing etc. It also adjusts to splash and turbulence created when the pool is in use. It is biased in the normal flow direction and its purpose is to prevent floating debris from washing back into the pool under the previously mentioned conditions. The water then passes through the skimmer leaving larger matter such as leaves, twigs, toys etc., trapped in the heavy meshed skimmer basket. From there the water travels towards the pump passing through the hair and lint strainer, where smaller (potentially harmful to the pumping equipment) matter is removed. From the hair and lint strainer the water moves to the centre of the pump impeller. It is worthwhile noting that up to this point the water has been sucked. From here on the water is being pushed through the filter equipment. Leaving the pump the water is forced upwards through the control valve into the top of the filter tank.

Entering the tank the water passes over a spreader (spray head) which ensures that the water is evenly distributed over the sand bed (filter media). This media is specially graded sand designed to trap small sedimentary bodies which have been held in suspension in the pool water. Entrapment occurs throughout the depth of the media. After percolating through the media the cleared water returns from the tank bottom back through the control valves to the pool. The Aquagenie return outlet in the pool is positioned just below the normal water level pointing downwards as designated by the design engineer as being the location most suitable to provide adequate circulation of the pool water, taking into account suite conditions.

ALWAYS PERSONALLY SUPERVISE CHILDREN SIX AND UNDER!
Don't delegate child care to other children around swimming pools!

Typical Filtration layout



ROUTINE FILTRATION SYSTEM MAINTENANCE

The system is designed for simplicity and ease of operation. Regular routine attention at all inspection points will eliminate most operational problems. It is easier to prevent trouble than it is to cure it! The frequency of attention required at various inspection points is largely allied to variables such as bathing density and regularity, changing weather and seasonal conditions, local site inconveniences and even nearby building operations or dusty roads. The recommendations below are intended as a guide only and are subject to variation based on your own experience and usage.

Failure to hold pH below the prescribed upper limit can lead to scale formation on the filter bed. Check the pH level often in season and correct if necessary. Check the filter pressure gauge. An increase in pressure above normal operating pressure is an indication that the filter needs backwashing. Check the skimmer basket, remove and clean as some of the heavier matter collected at this point can break down and collect in the hair and lint pot.

Vacuum the pool regularly. If you have an Aquagenie fitted, this will not be required as often as those pools without. (refer to separate section). Remove the hair and lint basket, clean and replace. If the pump is below water level it is advisable to replace the pot lid temporarily to prevent water loss while cleaning the basket. If the water level in the pot drops or disappears completely when the lid is removed, refill with water before replacing the lid. Never allow the pump to run for more than a few seconds with air in the system. Running the pump without proper priming can cause the seals to overheat. Resultant seal damage will cause the pump to leak. The impeller is also open to damage when air is present. If difficulty is experienced in retaining water above the outlet to pump port in the lint pot remove the skimmer basket and ask someone to hold a rag or plug firmly over the skimmer outlet, (in the base of the skimmer). The lint pot can then be topped up and the lid replaced. The plug must then be removed coincidentally with starting the pump. Indications of the need for cleaning the hair and lint strainer are:-

- A reduction in rate of flow at the pool return outlet.
- A drop below the normal filter pressure gauge reading.

To maintain a clean filter bed, you should ideally backwash the filter at least once a week. As this is not the usual case, it is acceptable to backwash only when the pressure rises on the gauge - however your filter sand will need replacing more frequently than those who follow the weekly backwash regime. If the control valve is so designed, move the lever to "RINSE" for up to 30 seconds after backwashing and before returning to the filter cycle. Remember that if you keep the pool surrounds clean, in order to prevent dirt from entering the pool water, the pool water will benefit.

AIR LEAKS IN FILTER SYSTEM:

The most common causes of air leaks are found in the hair and lint pot lid seal or in the filter tank inspection cover or plate seal. Other less frequent sources of trouble are filter line joints, damaged hose clips, joints between the hair and lint pot and pool or pump and pump cover plate joints or water seals. Vibration in the pump (usually accompanied by a rumbling noise) arising from the presence of air in the system can strain either of the hair and lint pot connections thus introducing an additional source of leakage which can admit air to the system.

Rectification of leaks other than from the first two causes should be carried out by your local Cascade serviceman. If you are a long distance from service facilities your local registered plumber should be consulted. Air leakages on the suction side of the pump should be rectified immediately.

The pump should be shut down until repairs are effected. If the lint pot seal leaks air do not try to rectify immediately by overtightening. This may distort the lid and increase the leakage. Remove the lid and inspect the seal for damage or embedded dirt. It is good practice, when cleaning the pot to wipe the seal and the top of the pot carefully. If the seal is damaged obtain a replacement as soon as possible. It is rarely necessary to remove the filter tank cover and it is most unlikely that leakage will occur at this point except during removal and replacement. At these times great care should be taken to ensure that all surfaces are spotless including the seal and that not even one grain of sand is present before replacing the cover.

REFINING THE FILTER BED:-

If the water is cloudy and remains so after several passes through the filter (four or five days of operation), the filter bed may need to be tightened.

Temporarily raise the pH to 8.0 by the addition of soda ash to the pool water and add approximately 3oz of alum (aluminum sulphate) to the hair and lint strainer. The alum will precipitate in the form of a milky white gel on the sand bed and will trap particles, which are so fine that they will pass through the sand bed. The alum will not precipitate properly unless the pH is over 7.6.

After a few filtration hours the pH will usually drop back to normal but if this does not occur, correct with pH decrease in the usual way.

If it is desired to remove the cloudiness from the water more quickly, shut down the filter, scatter alum liberally over the whole of the water area (about one pound per three thousand gallons) and leave standing for 2 hours or more. The alum will gel and cause the cloudy particles to sink to the floor of the pool.

Using the vacuum head or a pool brush on a long handle sweep the gel into a small area very gently, disturbing the water as little as possible, Connect the vacuum hose, turn the control valve to 'waste' and vacuum up as quickly as possible.

Under no circumstances allow this material to pass through the filter. Failure to observe this caution will result in a clogged sand bed which will be very difficult to clear. If the above rapid method is used the time taken for the gel to sink is dependant upon the pH being preferably up to 7.8, but in any case it must be over 7.6 for satisfactory results. More satisfactory results can be achieved if the water is dosed in the evening and the sweeping and vacuuming operation is carried out in the morning. After completion of the operation and running the filter for approximately one hour, check the pH since the presence of alum in the water may lower pH below 7.2. Correct pH with soda ash if necessary.

FLOW CONTROL VALVE (a.k.a MPV or "Multi-Port Valve" and even "Vari-Flo" valve)

The multi-port valve is of the very latest design incorporating easy operation and maintenance free service.

The purpose of the Multi-Port Valve is to enable you to carry out all pool maintenance operations quickly and easily by operating the valve control lever and the pump motor switch. There are six control positions indicated plainly on the top cover of the control valve.

The control lever is pivoted and spring loaded and includes a shaped point which locates in any selected point of the hollow star on the valve cover. To operate you must switch off the pump motor, press the lever downwards and rotate to the desired position ensuring that the lever point drops snugly into the hollow star point.

X NEVER CHANGE THE MULTI-PORT VALVE POSITION WHILE THE PUMP IS RUNNING

The six MPV port positions and their functions are

1. Filter.

This setting and the progress of water through the filtration system has been described fully elsewhere in this manual, except to mention that ordinary light vacuuming of the pool is performed with the lever in this position.

2. Backwash.

With this setting, the flow of water in the filter tank is reversed. Water passes up through the filter media and out through the MPV waste port. (this is usually piped to an adjacent drain), With the flow of water in this direction, the top or filtering layer of the media is lifted and expanded allowing dirt which has been trapped to be washed out and floated away to waste. The sand, though it is tumbled about by the water stream, is heavier than the dirt and stays in the tank. The tumbling action helps to scour the sand clean. Never vacuum with the valve in this position.

3. Rinse.

This position on your MPV valve allows the water to pass through the filter in the normal (filter) direction but the outflow is diverted to waste instead of returning to the pool. This position should be used for initial start-up cleaning or immediately after backwashing. It will wash out any residual dirt trapped in the lines during backwashing or which is remaining in the tank while the filter bed is re-forming. This position should be used for about 20 seconds after every backwash cycle prior to resetting the valve lever in the filter position.

4. Waste.

The water passes directly from the pump through the MPV to the waste outlet and bypasses the filter tank. This setting can be used to lower the water level in the pool. If the pool is extremely dirty initial vacuuming should be done on this setting, time spent on vacuuming can be reduced by gently sweeping heavy debris into a small area with the filter system turned off before commencing to vacuum. The heavy debris can then be removed in a very short time. The water loss can also be reduced by running water into the pool during this operation.

5. Closed.

With the control lever in this position, no water from the pool may enter the MPV as the inlet port is plugged. This setting should be selected at all times when cleaning the hair and lint strainer.

6. Recirculate.

Water is drawn from the pool and bypasses the filter, returning to the pool through the inlet fitting. Thus, maximum flow is achieved. Mainly used as a check position by servicemen.

ALWAYS PERSONALLY SUPERVISE CHILDREN SIX AND UNDER!
Don't delegate child care to other children around swimming pools!

DONT'S

- ✘ NEVER vacuum with the control valve on backwash.**
- ✘ NEVER alter valve positions while pump is running.**
- ✘ NEVER vacuum with other than a vinyl-liner pool brush (as supplied with pool).**
- ✘ NEVER vacuum with a broken vacuum brush.**
- ✘ NEVER allow the pool water to drop below the level of the bottom of the skimmer**
- ✘ NEVER allow pump to run when the vac equipment is not immersed in the pool.**

GENERAL POOL CARE

VACUUMING.

The vacuum cleaning equipment supplied with the pool is operated from water flow produced by the pump. Effectively, the water inlet for the pump is transferred by the hose from the skimmer to the vacuum brush head. Before connecting the vacuum equipment, backwash the filter, clean out both the skimmer basket and the hair and lint traps. After cleaning the skimmer basket, replace it and fit the vacuum plate supplied (commonly known as a "mushroom") over the skimmer basket.

Next connect the vacuum hose to the vacuum brush, which should already be connected to its handle. The next requirement is to remove all air from the vacuum and filter cycle prior to commencing of the cleaning process.

Turn the pump on with the control valve in the "FILTER" position. With the brush with hose connected, under the water in the pool, place the other end of the hose over the water return outlet and fill the hose with water, driving all air from the pumping cycle. Once this air is expelled and the hose is filled with water, connect the hose to the vacuum plate in the skimmer, the water pumping point now has been transferred from the skimmer to the vacuum head, and the pool is ready to be cleaned.

FULLY FLOOD VACUUM HOSE BEFORE CONNECTING TO SKIMMER VACUUM PLATE

For best results, the vacuum should be moved slowly, a fast action will tend to stir up dirt which will settle again later. Always vacuum with a forward movement of the brush, in particularly dirty or overfull pools vacuuming can be carried out with the control valve directing the water from the pool directly to waste, bypassing the filter.

Remember that the water is not being returned to the pool and that the water level will have to be monitored ensuring that it does not drop below the level of the bottom of the skimmer aperture. If the pool is to be vacuumed to waste, connect the equipment as previously described, only changing the control valve position after the pumping cycle is proven. When vacuuming is complete, switch off the pump, remove the hose from the pool, disconnect it from the skimmer and drain all water from it before storing it in the shade. Exposure to prolonged sunlight will deteriorate the hose and shorten its life span. Backwash the filter, clean both the skimmer basket and hair and lint pots once again. In excessively dirty pools it may be necessary to clean both traps, and to backwash the filter during the vacuuming period.

CARING FOR YOUR CASCADE VINYL LINER

Your Aqualux .50mm or .77mm pool liner is resistant to chemicals normally used in the treatment of pool

water and if the pH level is maintained close to 7.6 and the CH at 200 and TA at 120 (but not more than 160), it will never need resurfacing during its expected lifetime of 20 to 25 years.

Please remember that Chlorine is a strong bleach (Hyperchlorous Acid) that will ultimately shorten the life of the pool lining if used in excessive quantities! FORTUNATELY by using OZONE for sterilisation of the pool water will mean you only need a VERY SMALL amount of chlorine (to take over when the Ozone unit is not running. (It only runs when the filtration is running - so there is a period of time when some CL is needed)

YOU WOULDN'T TIP CHLORINE BLEACH INTO THE WASHING MACHINE ONTO COLOURED CLOTHING (EVERY WOMAN KNOWS THIS!) SO DON'T TIP CHLORINE STRAIGHT INTO THE POOL - ESPECIALLY IN GRANULAR FORM OR TRI-TABS. YOU WILL DAMAGE THE INTERIOR! Add everything through the skimmer, and keep Chlorine use as low as possible!

There is little to do to keep it looking like new for many years, but there are a few simple precautions to take:

- ✗ NO KNIFES OR SPEARGUNS IN THE POOL**
- ✗ NO HARD CANOES, OR HARD FIBERGLASS SURFBOARDS crashing into the liner**
- ✗ DON'T USE A BROKEN OR DAMAGED POOL BRUSH OR VAC HEAD BRUSH!**
- ✗ USE ACRYLIC GLASSWARE AROUND THE POOL - it's sensible and avoids cut feet**
- ✗ USE ONLY 3M SCOTCHBRITE PADS and NON SCRATCH JIFF to clean scum line**
- ✗ Don't use metal scrubbing pads on printed pattern liners**
- ✗ NEVER LEAVE THE VAC POLE WITHOUT A "TOOL" ON IT!**
THIS IS THE GREATEST CAUSE OF CUTS IN LINERS - THE END OF THE VAC POLE IS SHARP AND SERRATED AND WILL CUT THE LINER IF DROPPED INTO THE POOL!

i DISCOURAGE DOGS FROM SWIMMING (They're dirt magnets, anyway)

The Liner Warranty does not cover mechanical damage such as cuts. Inspection of maintenance equipment such as hand skimmers, floor and wall brushes, leaf rakes, vacuum brushes and handles to eliminate burrs or sharp corners is essential. The vacuum brush supplied with the pool is the only type recommended by the manufacturer. Other types, metal, roller etc., may damage the pool liner.

Dirt and scum at the water line can be removed by employing a small quantity of household detergent and a "Scotchbrite" or similar plastic scouring pad. Never use a metal scourer or cloth abrasives, these items will damage any pool surface.

Other than mechanical (cutting) damage, the pool may be damaged chemically (chlorine cooked) by allowing too much chlorine (a.k.a Hypochlorous acid) to develop, or a too low pH level. As the Aquagenie tabs are naturally low in pH, you MUST OCCASIONALLY add SODA ASH to raise the pH and Calcium Chloride to raise the Calcium Hardness of the water. Failure to do so may result in the vinyl "growing" and forming puckers. To remove these, you will need to raise the pH dramatically, by using SODA ASH (pH of 8.0) or even CAUSTIC SODA (pH of 14).

Any time the pool is OVERCHLORINATED you run the risk of this happening, so be aware of conditions that may lead to this situation - such as running the pool for days and days with the cover on, and the Aquagenie producing too much chlorine, as might happen in a wet summer.

Providing the pool is kept clean, the absence of bathers and reduced sunlight hours will result in only occasional chlorination being necessary.

POOL SAFETY

- ✗ Avoid exertive swimming when alone - if anything happens you may need assistance.**
- ✗ If you must swim alone, avoid any potential accident by restricting yourself to a quick dip.**
- ✗ NEVER let children swim alone..... EVER! ... Always monitor them!**

OUTSIDE THE POOL

① Children require constant supervision. Never let them play in or around the pool without close and continuous adult supervision.

① Basic lifesaving equipment should be provided and available at all times, including a light weight strong pole with blunt ends at least 12 feet long or a ring buoy to which has been firmly attached a long throwing rope.

① A selected list of emergency telephone numbers should be on hand which includes the nearest available physician, ambulance service, hospital, police, fire and/or rescue unit.

The POOL FENCING ACT 1987 and Building Act 1991 require that the swimming pool be protected by a fence, wall, or building which is impenetrable by toddlers up to 6 and at least 1200mm (4ft) high. This barrier should not afford any external handholds and must have an outwards opening gate fitted with a self-closing latch above the reach of toddlers. Hardware for permanent locking should also be provided. The council will have guidelines on pool fencing and will provide a pool fence inspection if required

① A pool alarm may provide an additional measure of protection, but is NOT a substitute.

① Pool covers provide protection and keep the pool clean, especially during long periods such as winter or vacation time. Excess water should not be allowed to accumulate on top of pool covers that are attached to the pool surround.

① Electrical equipment used for the pool should conform to local regulations or the latest National Electrical Code requirements. Never allow electrical appliances near the pool that have not been protected by a ground fault circuit interrupter.

① A handy complete first aid kit is a practical addition.

① Decks around the pool should be kept clear of debris and clean. Slippery surfaces can cause accidents. Make sure all cups and dishes used at poolside are nonbreakable.

① There should be a periodic safety and maintenance check to all pool appliances and equipment. If you need help, contact your local Cascade dealer who can provide you with these services.

**ALWAYS PERSONALLY SUPERVISE CHILDREN SIX AND UNDER!
Don't delegate child care to other children around swimming pools!**

SAFETY INSIDE THE POOL

- ❶ Pools are for swimming in, learning in, relaxing in... and playing in, but not horseplay or roughhousing in! Invest in a couple of good safe pool games like water basketball and water volleyball if you or your family like aggressive water sports!.
- ❶ Establish sensible pool rules at the very beginning; enforce them constantly and firmly.
- ❶ Learn to swim. Make sure all pool users are well qualified. Pools are for swimmers...non-swimmers have only one reason to be inside a pool and that's with a qualified teacher teaching them to swim.
- ❶ Be careful of inflatable toys and mattresses. Remember those items are also deflatable.
- ❶ Provide responsible adult supervision at poolside at all times.
- ❶ Pools are like driving a motor vehicle: They don't mix well with alcohol. Keep inebriated guests out of the pool and poolside area.
- ❶ Never swim alone or allow others to do so. Sudden cramps can occur even in the most accomplished swimmers. NEVER let kids swim alone!!!!
- ❶ And, speaking of cramps, allow a meal to settle before going into the pool - and - if you're over-tired, go to bed, not for a swim.
- ❶ Exercise caution when diving from tiled decks and only dive at the deep end.
- ❶ Stay out of pool during thunderstorms -- a particularly important rule if there's also lightning.

HEALTH

- Many pool shops & service companies offer weekly, monthly, and/or bi-annual pool service. These companies will prepare your pool for safe, healthy swimming in the spring; keep it in top shape during the season, and close it for the winter. At a minimum, annual periodic inspections by professionals are encouraged.
- Clean and vacuum the pool regularly to clear the debris and dirt from the pool. (Many pool companies are now offering various types of automatic equipment - which makes this job easier and faster). The Aquagenie equipped pool will stay cleaner, for a longer period. You may not need an automatic pool cleaner.
- The pH and chlorine level of the pool is important in providing a safe and healthy environment in which

to swim, so keep a suitable pool testing kit handy and use it periodically - at least monthly during the swimming season. Provide chemical treatment as indicated by the test kit.

- Make pool upkeep the responsibility of the entire family.
- Hair lotion and suntan oils make a nice appearance at poolside, but are hard on your pool's filtration system. Shower before entering the pool.
- Swimmers with open Sores or Colds and infections should not use the POOL.
- Be careful not to overexpose yourself to the sun.

DIVING BOARDS

- Diving boards and slides should not be installed on residential swimming pools which were not built to sufficient length, width or depth to accommodate them. The minimum depth for a residential type diving board is 2,400mm (8'0") - Check with your pool builder on the pool depth intended before adding a board.
- Children, particularly, like to use the diving equipment and slide. Give them good supervision to insure that there is no horseplay, and never allow adjustments to the diving board. Install a pool ladder near the diving board in the deep end of the pool.
- Pay close attention to the surface of the board, making sure the nonslip surface is always in good repair. Don't allow running on the board, or any horseplay!
- Allow jumps and dives only from the front of the board.
- Residential pool diving boards were not designed for use in Olympic tryouts. Keep the dives simple.
- Make sure other people don't play around or under the board when it's in use. A lifeline across the pool where the deep-end slope begins will help separate the two parts of the pool...and also keep inexperienced swimmers out of deep water,
- Jump boards and water slides require the same attention and care as do diving boards and should be firmly anchored.

We thank you for investing in your family's health by installing a Cascade swimming pool. We trust that you will enjoy your pool, and the family fun it will bring you, for many years to come.

You may be pleased to know that your pool is the most ecologically and environmentally sound pool available, with a low carbon footprint, full insulation and energy saving devices to ensure sustainability of the planet. Congratulations on your choice!

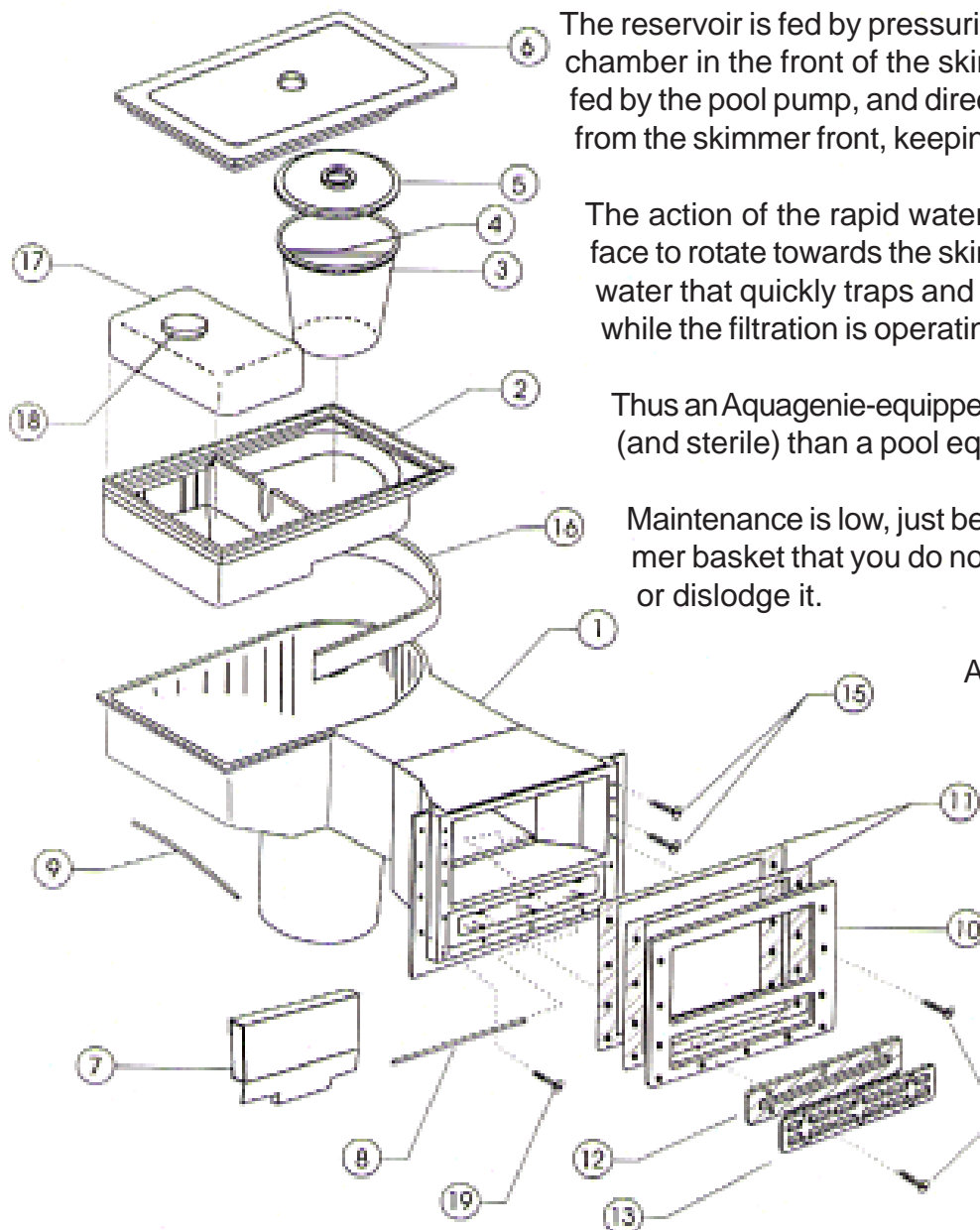
**ALWAYS PERSONALLY SUPERVISE CHILDREN SIX AND UNDER!
Don't delegate child care to other children around swimming pools!**

The AQUAGENIE SKIMMER

Fitted to all Ultimate pools since 1996, the Aquagenie is a major breakthrough in pool care and chlorination, especially when used in conjunction with the Ozone generator.

The Reservoir contains a canister that will take Tri Super 90 stabilized chlorine tablets. The usual quantity for the average 5 x 10m pool is 8 - 12 in a pool that runs 12 hours daily in summer months when the Tabs are the primary sterilisation source, and 2 - 4 tabs when the Ozone is the primary source.

Experimentation to find the right dose is needed, as each pool is different.



The reservoir is fed by pressurized water taken from the plenum chamber in the front of the skimmer. This chamber is pressure fed by the pool pump, and directs a sheet of water down and out from the skimmer front, keeping the pool floor clear at this point.

The action of the rapid water discharge causes the pool surface to rotate towards the skimmer weir, thus creating a flow of water that quickly traps and leaves etc. that fall onto the pool while the filtration is operating.

Thus an Aquagenie-equipped pool will remain far more clean (and sterile) than a pool equipped with a standard skimmer.

Maintenance is low, just be careful when removing the skimmer basket that you do not snag the feeder tube and break or dislodge it.

Also, check that the reservoir is being fed water by looking periodically into the skimmer top to see that the flooded reservoir is actually spilling out into the water flow through the skimmer.

Sometimes the hose that feeds the water into the reservoir will become dislodged - or even broken or perished.

Some models had a small PVC fitting that was easily broken while removing the skimmer basket!

Replacement hoses and fittings are available for a few dollars from Aquatech Industries (09) 636 9921



A few Aquagenie "don'ts":

- ✘ Don't use the larger 3" TRICLOR tabs in the Aquagenie - especially don't break them to fit the canister! Use ONLY the Tri-Super-90 "Oddfellow sized" tables available from Aquatech or the on-line Cascade Pool Owners Club.
- ✘ Don't ever use TRICHLOR tabs in the skimmer basket, they will wreck your filtration!
- ✘ The Aquagenie has a built-in overflow leveler - DO NOT infill around the skimmer with concrete or any product that will restrict this overflow. If pool water is allowed to flood up and cover the reservoir, highly saturated chlorinated water will flow out the front of the skimmer when the pump stops, and may cause bleaching damage to the pool liner. THIS IS IMPORTANT!
- ✘ Don't let the "slot" in the front of the skimmer become blocked with debris - periodically check that the water flow is not impeded by obstructions that have passed through the filter and became stuck.

ALWAYS PERSONALLY SUPERVISE CHILDREN SIX AND UNDER!
Don't delegate child care to other children around swimming pools!

POOL TERMS DICTIONARY - It Helps if you understand the terms and names used!

Most of the following terms are used throughout this manual, and are common to the swimming pool industry. The following abbreviated summary may prove useful to you in understanding the care and maintenance of swimming pools. NOTE: a.k.a. means "Also Known As"

ACID:

Common acids for pool use include Sodium Bi-Sulphate (pH Decrease a.k.a "dry acid") and Hydrochloric Acid and are used to lower pH and for service work such as cleaning Salt Cells (if you have a salt chlorinator fitted) Adding Acid will also lower the TA and Calcium Hardness, so a further treatment of Water Neutraliser (Bicarbonate) will be needed to restore pool water balance

ALKALINITY INCREASE

A pool chemical (usually sodium bicarbonate) which will increase the pH and alkalinity of a swimming pool. Pools should be kept in the middle of the range 7.2 - 7.8 (i.e. 7.6) for prolonged liner life. Also referred to as " pH Increase"

ALGAE:

Pronounced "Al Gay" - A microscopic plant life that thrives and multiplies very rapidly especially in warm, unchlorinated water - doubling in quantity approximately every four hours. By the time you can see it in your pool - you already have a problem! Algae cause green, slimy patches and stains to develop on the bottom and sides of the pool and green water. There are many strains of algae, but the most common are green, reddish-brown and black. Others - known as osteocyte types - are particularly hard to remove and colour the pool water an emerald green. These types are usually associated with sea-water and can occur in pools near the ocean. Although algae are not harmful to humans, they will discolour the pool water.

AQUAGENIE:

An American made skimmer/chlorine feeder system, which operates on high pressure pool water returning through a horizontal slot opening in the front of the poolside faceplate. This jet stream of water is directed downwards, keeping the pool floor in the vicinity clean. A small amount of returning water is siphoned off into a small reservoir, which houses a canister containing Tri-Chlorio-S-triazine-trione tablets (Quadrachlor - a.k.a Stabilised Chlorine). This drips into the suction side of the filtration system, and assures complete sanitisation of the pool water. The rotating action of the pool surface, caused by the downwards jet stream, causes floating objects to quickly move into the skimmer - keeping the pool much cleaner than traditional skimming methods.

As Quadrachlor tabs have a low pH it is important to check levels periodically as a low pH may be detrimental to vinyl liners. Standard 3" (72mm) Tri-Chlor tabs should not be substituted for Quadrachlor tabs as they will not fit the canister, and are hazardous to break apart.

Note: Where an Aquagenie is fitted, there are several precautions of which you must be aware:

- ⊗ Don't let your pool to overflow so that the tablet canister is flooded - highly chlorinated water will spill out of the skimmer aperture causing liner bleaching and damage. Keep the Calcium Hardness up to 200 and Total Alkalinity at 80 to 160 (Middle is 120) or wrinkles may form in the pool liner.
- ⊗ Don't overflow your canister or over-chlorinate - a higher than required chlorine level can be detrimental to pool liner, equipment, pumps, and heaters fitted after the filtration

AVAILABLE CHLORINE:

A measure of active chlorine present in your pool water to combat germs and algae. a.k.a Free Available Chlorine (FAC)

BACTERIA:

Microscopic organisms which are the cause of fermentation and putrefaction and also harbour and produce disease. They can be controlled by treatment with chlorine. Bacteria ARE harmful to humans, and can spread amongst swimmers. It is important that they are eliminated from the pool by regular superchlorination.

BALANCED WATER:

Pool water that is chemically balanced; that is to say (ideally) water that has a pH reading of between 7.2 and 7.8 and contains the proper relationship between calcium hardness, pH and total alkalinity. This balance is the most important aspect of pool care, and an understanding of the importance will drastically reduce your pool chemical costs (See WATER BALANCE for more comprehensive discussion of this subject)

CHLORINE:

Usually found as a granular compound (70% - 90% yield) with added stabilisers, Calcium Hypochlorite (a.k.a Granular Chlorine) is a powdery substance similar in appearance to chalk. It can also be found as a lower yield Sodium Chloride (a.k.a Liquid Chlorine) usually in 10 or 20 litre jars. When added to pool water, "chlorine" changes to Hypochlorous Acid - the chemical that will attack and destroy algae and bacteria in your pool. Another form of chlorine is found in common salt, which is freed by electrolysis into sodium chloride (then Hypochlorous Acid once again) (see SALT below)

CHLORINE DEMAND:

The actual amount of available chlorine that is consumed in the destroying of algae, bacteria and organic or nitrogenous matter in the pool water.

CHLORINE SMELL:

There is a basic misconception that "too much chlorine" produces an odour referred to as "chlorine smell". In fact the opposite is true. **(Chlorine is an odorless yellow/green gas which is toxic at concentrations of 2.5ppm or more)** The "chlorine smell" is actually a by-product of an incomplete chemical reaction between free available chlorine and nitrogenous matter (hair, skin flakes, urine etc.) whereby there was insufficient FAC available to combat in entirety the presence of such matter. The incomplete reaction produces a substance called chloramines - and they really stink! The remedy to this situation is to add more chlorine! If your children return from school smelling of "chlorine" - write the school Headmaster a note asking him to either look after their pool sanitation better, or alternatively excuse your child from swimming class - because a pool that smells this way is a health hazard!

CHLORINE RESIDUAL:

Active chlorine in the pool that is available for continued control of bacteria-algae after the initial chlorine demand has been met - usually in the range 1.0 to 2.0 ppm (parts per million)

CLARIFIER

Usually liquid as a proprietary product (one brand: "Shimmer & Shine") or in powder form (Aluminum Sulphate - or FLOC) this product will consolidate a contaminated pool (see TURBIDITY) causing the contaminants to sink to the pool floor, where they may be vacuumed out to waste

COMBINED CHLORINE:

Most DPD Test kits read the FAC immediately, but some older orthotolidine (a.k.a OTO) kits read FAAC then gradually the sample is contaminated by the effects of combined chlorine. Combined chlorine can

also include chloramines (see "CHLORINE SMELL) so may give you a misleading idea of how much chlorine is actually in your pool. Hint: always use DPD testers!

CONTROL VALVE:

A variable port valve mounted on top of the filter unit to direct water flow from the pool through the filter or to the disposal point. Also referred to as MPV (multi-port valve) Do not operate the MPV while the filter is running! Damage due to "water hammer" may occur!

DIATOMACEOUS EARTH:

a.k.a "Fullers Earth" this is a natural filtering agent consisting of the shells of tiny sea creatures called "diatoms" who perished over 50 million years ago! Excavated in only one place in the world (USA) they have been used as filtering media for many years. Not common in NZ, however, as the residue (which must be periodically flushed down the sewer) is environmentally unfriendly.

FILTER SAND:

Cascade uses a high-rate sand filter on its pools. This is a pressure fed vessel - usually made of plastic - that contains filter sand. Filter sand differs from ordinary sand because it is graded for consistency. As this graded sand will pass between 1mm thick wire grids of between 14 and 24 to the inch, it is called 14/24 sand. The sand in your filter will typically last for between 8 and 12 years, but frequent backwashing will prolong the time between sand changes, as infrequent backwashing will allow the sand to become clogged with solids and debris. Backwash at least monthly "whether it need it or not" during summer months.

FLOC

An abbreviation for "flocculation" a scientific term for consolidation of matter in a pool, causing it to bind together creating more mass which - being less buoyant - sinks to the pool floor for easier removal by vacuuming to waste.

FOREIGN MATTER:

Materials such as dust, twigs, grass clippings, algae spores etc., carried into the pool by wind, rain and bathers. They may carry bacteria, which would increase consumption of chlorine.

HAIR AND LINT POT:

Unit with clamped or screw on lid (usually clear plastic), mounted onto the front of the pump as a preliminary screen for leaved and hair that got through the skimmer basket. a.k.a Hair & Lint Strainer.

HYDROCHLORIC ACID

Usually in 30% Concentration liquid form, used to treat Black Spot on fiberglass, also to clean Salt Cell where saline (Salt) Chlorinator is fitted to filtration system, or to lower the pH or TA in a pool - HAZARDOUS! See section on correct handling procedures

NEUTRALISER

Common name for Sodium Bi Carbonate (bicarbonates of soda or "baking powder") this chemical has a pH of 8.0 and is used to raise the pH and hardness of pool water.

POOL CAPACITY:

To estimate pool in Imperial Gallons, multiply pool length by breadth by average depth by 6.25. As it has been more common in recent times to calculate pool capacity in liters, the calculation is even simpler: multiply pool length by breadth by average depth for cubic meters of water. One cubic meter is 1,000 liters -or 1Kl. E.g. a 5m x 10m pool with average 1.5m would be ((5 x 10 = 50) x 1.5 = 75) or 75,000 liters.

POOL PUMP:

Electrically driven and usually self-priming, the pump is situated next to filter tank, serving to draw water from the swimming pool via a surface skimmer, then force it through the pool filter (which contains filter sand) then back to the pool trough return nozzles. This is a closed circuit recirculation system.

pH:

pH stands for positive (or potential) Hydrogen. It is described by a numerical rating to indicate acid or alkaline condition of water in a logarithmic range of 0 - 14. A pH of 7.0 is neutral, a rating over 7.0 is alkaline and under 7.0 is acid. A vinyl liner swimming pool is required to remain between the pH values 7.6 and 7.8 with 7.6 being "ideal".

PH is a scale by which the acidity or alkalinity of water is measured. The whole range reads from zero in logarithmic steps up to 14.

Numbers descending from 7.0 down to zero indicate increasing acidity and numbers increasing from 7.0 up to 14.0 denote increasing alkalinity. A reading of 7.0 is neutral: the pH of your eye is 7.4

Experience proves that pH in a vinyl liner pool should be held between the range of 7.2 to 7.8 for ideal conditions. 7.6 is ideal. This along with correct chlorine residual will keep pool water clear and healthy.

Incorrect pH is responsible for poorly coloured or cloudy water, eye and skin irritation and corrosion of metal parts such as pumps and ladders. Readings between 7.8 and 8.0 are tolerable but the chlorine effectiveness is far less. Readings above 8.0 give rise to minimal chlorine effectiveness. At readings of 8.4 chlorine effectiveness is negligible, scaling will occur and bathers will suffer irritation. The best pH for a Cascade pool liner is close to 7.6, pH is adjusted by adding a suitable alkali to an acid pool and a suitable acid to a pool yielding an over high alkaline test.

P.P.M:

An abbreviation of "parts per million" which is how concentration of matter in water is usually referred to (See TURBIDITY). It is applied to pool water ratings as the quantity of any residual per million parts of water

SALT CHLORINATION:

A good supply of "chlorine" may be obtained by the electrolysis of saline water (usually .02ppm) into sodium hypochlorite. This occurs in a "salt cell" which is usually an electrode of stainless steel encased in a clear PVC tube so that the process may be observed. Many people think "salt" is better than "chlorine" as they imagine that salt is "more healthy" and has no odour. This is far from the truth, as the same chemical reaction takes place (i.e. the production of Hypochlorous Acid) whether the initial introduction is via salt, sodium chloride, or calcium hypochlorite. The process of electrolysis also produces Sodium Hydroxide - which has a very high pH - so if you have a salt chlorinator fitted, you will need to do periodic pH checks (at least every two months) to see how much ACID you need to put in the pool to bring the pH down to correct levels.

SKIMMER:

Commonly a plastic "box" attached to the outside pool wall, connected to the intake line of the filter. By breaking the surface tension, it removes surface debris from the pool water and retaining it by means of a floating weir. (It "skims" the pool surface - hence the name) The weir is hinged back into the skimmer body and stopped from floating more than vertical, thus trapping floating debris within the body of the skimmer for manual removal of the mesh skimmer basket. See also AQUAGENIE

SODA ASH

See pH Increase, or sodium bicarbonate - also referred to as Neutraliser, of pH Buffer

STABILISER:

A chemical agent (a.k.a Cyanuric Acid) which when applied to outdoor pools in recommended amounts slows the dissipation rate of the chlorine residual by sunlight. Normally the cyanuric acid level should not exceed 50 ppm or 20 - 30 grams per cubic meter of water as it will render the FAC ineffective.

SUPERCHLORINATION:

Superchlorination is the term used for a massive dose (usually 10ppm) of liquid or calcium hypo to burn out any stubborn or resistant algae or bacteria. a.k.a "shock treatment" it should be performed at least fortnightly in summer months - or if bathing loads are high (or lots of kids have been swimming) at least weekly. Normal Cal Hypo or Liquid chlorine is sufficient for the purpose.

SUSPENDED MATTER

Particles that do not settle to the bottom. They give a cloudy or milky appearance to the water.

TIME CLOCK:

Every Cascade Classic pool is supplied with a time clock to control filtration cycles. It is essential that you time your pool to filter during daylight hours - if only to keep from annoying your neighbours. In summer months - especially if hot and windy - filter your pool a minimum of 10 to 12 hours daily 8am to 8pm is suggested. In spring and autumn, this can be reduced to 8 hours, and during winter 2 to 4 hours should suffice. Do not turn the system off "for winter" as the cost of reviving and rebalancing the pool will outweigh the small amount of power usage during winter.

TURBIDITY:

A measure of cloudiness in water due to the presence of contaminates. At levels of 20,000 ppm or more, the pool water "looks cloudy". To remedy this situation, superchlorinate to 4ppm, filter pool 24/7 until clear. In extreme cases, add Clarifier or FLOC to consolidate matter, then vacuum pool with MPV on WASTE position. See SUSPENDED MATTER above.

TRI-CHLOR TABLETS:

The large 3" or 72mm tri-Chlor tabs are useful for pool chlorination when used in the correct feeder - such as the Waterco "Water King" model or other in-line feeders.

Do NOT however, break them up to use in the Aquagenie Skimmer (they may explode in your face while you try to break them) and NEVER under any circumstances place them either in the skimmer basket, or directly onto the pool liner.

If placed into the skimmer basket, when the pump stops at night the highly chlorinated and very low pH mixture in the skimmer body leaches out the skimmer front and cascades down the pool wall.

This low pH situation will cause blistering and deformation (stretching) of the pool vinyl and is NOT COVERED in the liner warranty! These same tabs placed on the pool floor will burn and blister the vinyl and at very least will leave a large 60mm size bleached white spot! Even the use of Floating Dispensers for these tabs is discouraged in vinyl interior pools as they can open inadvertently during pool play by children and the tab can fall to the pool floor - causing damage. Do be careful when using this product, and if you have an Aquagenie - use only the correct chemicals intended for it.

VACUUM SET:

Your pool comes equipped with a comprehensive pool vacuum cleaning set, consisting of a Vacuum Brush Head, Vacuum hose and extendable vacuum pole, a leaf scoop and leaf brush. The pool skimmer comes with a dinner-plate sized Vacuum Plate with a 40mm hole in the centre. This is inserted into the skimmer and the vacuum hose is then inserted - thus extending the suction to the far end of the hose

(which is in turn plugged into the Vacuum Head Brush) The hose must be "flooded" before inserting into the Vac Plate, and the brush end must be submerged.

WALK-OUT STAIRS: (This section does not apply to ULTIMATE pools, which have liner-covered steps) If you have fibreglass walk-out stairs fitted to your pool, there are a couple of extra precautions needed to keep them in good condition. Being gel-coated fibreglass reinforced plastic, you will have to ensure that the pool water pH is maintained between the values 7.0 and 7.2. The curing process of "fibreglass" is assisted by the inclusion of Cobalt in the gel coat, which reacts and produces heat to assist the curing process. This cobalt remains in the surface of the step that is exposed to pool water.

A high pH - such as that created by a Saline Chlorinator - may lead to cobalt spotting on the step surface as the cobalt crystallises - causing a "black spot" to appear. These spots are easily removed with the application of Hydrochloric Acid (tip it directly onto the spot*) but the less number of chemicals you need for your pool, the better, so prevention is better than cure.

Use Hydrochloric acid also (in solution) to clean Saline Chlorinator's electrode when buildup of calcium is detected. Use a PVC container (an old CLEAN 1 litre milk container with the top cut off is a useful container) Add 2/3 WATER to container, topping up with ACID to avoid spills.

*** CAUTION!**

OBSERVE SAFETY PRECAUTIONS WHILE HANDLING HYDROCHLORIC ACID

- 1. Wear latex or rubber Safety Gloves**
- 2. Wear a rubber or PVC protective apron**
- 3. Wear eye protection or safety glasses**
- 4. Wear Gumboots or foot protection**
- 5. Half fill intended container with water - ADD ACID TO WATER (NOT the other way around)**
- 6. Avoid contact with skin - if accidentally exposed, IMMEDIATELY flush with cold water**
- 7. Dispose of used acid solution safely - it is still potent and may cause harm!**
- 8. Store any Acid in secure location - away from children, pets, motor vehicles etc.**

Treatment with Hydrochloric Acid lowers both pH and Total Alkalinity - so be sure to adjust the pool water accordingly after Acid treatment. Usually Alkalinity Increase (Soda Ash) will do this.

WATER BALANCE

Probably the most essential subject you will need to understand is the relatively recently developed concept of WATER BALANCE. It was discovered in the mid 1970's that there is a CRUCIAL relationship between Total Alkalinity, pH, and Calcium Hardness. If your pool is "balanced" the pH will remain stable, and your pool will more economical to operate as you will obtain more effectiveness from your chlorine.

A correct Total Alkalinity will act as a buffer, which will prevent sudden changes in pH if for example there is a sudden downpour of acidic rainfall. Too much Calcium Hardness can cause cloudy water, encrustation of pipes and equipment, and the filter sand in your pool filter can lose effective filtration due to calcification.

There are marginal differences between what is acceptable water balance for each type of swimming pool. For example a fibreglass pool is better off with a lower pH than the other pool types. Another

confusing factor is that "Pool Shops" using computerized water analysis equipment must be "generalized" to fit all pool types, so their recommendations may not be correct, and may in fact contradict, the advice given to you by your pool builder.

New Zealand water is mostly generated from rainfall, which "distills" the water thus reducing the dissolved minerals etc. to practically nil by the time it reaches your household water supply. This is why we must add "body" to the water by increasing dissolved minerals. These are harmless.

DRY ACID (pH decrease) should be used to reduce your pool alkalinity and SODAASH (pH increase) for neutralizing pool acidity. If these products are not available in your area ask your local Cascade dealer for a suitable alternative recommendation.

If the water supply in the area is 'hard' the alkalinity level may be too high. A gradual increase in alkalinity also occurs due to the use of granular chlorine (calcium hypochlorite). If the pH of the water goes above 7.8 precipitation of insoluble components will occur and the water will become cloudy. It is not possible to reduce the pH of inherently hard water suddenly by the use of large quantities of pH decrease and repeated small dosages may be necessary.

The quantity of pH decrease used should not exceed one pound per 5000 gallons of pool water at any one time (2kg to 20KI). It is suggested that in hard water areas (where total alkalinity of supply exceeds 300ppm) half the above maximum quantity, or even a considerably smaller dosage should be tried until the behavior of the water is established by repeated testing.

It should be understood that high pH readings can be obtained from water with high total alkalinity (eg. 200ppm or more) or from water with low total alkalinity of, say, 20ppm. The best range for vinyl liner swimming pools is between 80 and 120ppm, and no more than 160ppm.

Identical pH readings may be obtained from pools with widely divergent total alkalinity levels and the pool with a high pH but low total alkalinity from the examples above would require one tenth of the quantity of pH decrease to obtain pH balance than the pool with a high total alkalinity level. Thus, the addition of a large quantity of pH decrease to a pool with a low total alkalinity level could turn the water acid and bring about the unpleasant results mentioned above.

Poolside test kits supplied with Cascade pools have included a means of testing total alkalinity but your local water supply authority should be able to tell you the average hardness of the water in your area. This information will serve as a useful guide of the procedure needed for the pool, and confirm the figures you obtain by poolside testing.

Where the water is hard you may well find the pH decrease will bring the reading down to a satisfactory level within an hour or two but within 24 hours the original high reading will recur. This may continue for some days but in due course the readings will tend to stabilize at a lower level and only occasional small dosages will be necessary. The best time to correct pH is in the morning after taking pH and chlorine residual tests.

Treating the pool with pH decrease.

PH decrease should be dissolved in water in a plastic bucket and poured gradually into the pool preferably over an area around the deep end. Avoid areas near metal fixtures. Strong solutions should be handled with reasonable care and spillage or splashing on clothes should be avoided. PH testing with the test kit is effected in the same manner as described for chlorine residual testing but using the pH reagent supplied with the kit. Remember to make the colour comparison against the pH colour spots within ten seconds of mixing, as a deeper color may develop due to the presence of chloramines.

Acidity usually occurs in areas where the total alkalinity of the water is abnormally low. Very little additional acid from various sources (including overdosing with pH decrease will lower the water to an acid condition.

Treating the pool with pH increase.

The total alkalinity of the water again controls the amount of pH increase or soda ash required to raise the pH. Read and follow the instructions on the container carefully. Single dosages should not exceed 1lb per 1000 gallons of water (2.5Kg to 5000 L). As a guide the following quantities may be used per 10,000 gallons (45,000 L) to raise the initial pH reading to approximately 7.5

The required quantity should be added to the skimmer while the pool is running

Pool Stabilization.

The benefits of stabilization have already been discussed in the paragraphs on chlorination. One treatment is usually sufficient for an average pool season. Additional treatment may be necessary towards the end of an extended season. The need for this is readily ascertained by an increase in the rate of dissipation of chlorine residuals.

Stabilisation is effected by the addition of Cyanuric acid and is carried out in this manner: -

1. Backwash filter. (refer pages on filtration).
2. Check pH and adjust if necessary. (to 7.6)
3. Superchlorinate (see Pool Chlorination).
4. 12 hours later add cyanuric acid at the rate of 2.5Kg per 5000 Litres of water directly into the surface skimmer while the filtration system is operating on the 'filter' setting.
5. Maintain filter operation for at least 6 hours after adding stabilizer.
6. Chlorine dosage for stabilized pools has already been dealt with under chlorination. The amount and frequency varies with weather conditions and use. Average conditions require the addition of 2ozs of chlorine chemical per 5000 gallons every other day which should maintain the residual between 1.0 and 1.5ppm as required for stabilized pools. If the residual reading is lower than 1.0ppm but some free chlorine is present 1oz of chlorine per 10,000 gallons will raise the residual approx. 0.5ppm.
7. Test for chlorine residual and pH level regularly and keep the pH between 7.2 and 7.6

Super chlorinate regularly as suggested under chlorination par. 6.

ⓘ IMPORTANT: Stabilizer dosage should be done with care and not indiscriminately.

The recommended level is 50ppm. Levels above 60ppm inhibit chlorine action. Before treating your pool ensure your gallonage calculation is correct. If cyanuric acid falls below effective levels, eg. Towards the end of an extended season, it can be corrected by using STABILIZED DRY CHLORINE which incorporates a cyanuric component.

ⓘ **DON'T MIX ANY POOL CHEMICALS - EVER!**

NEVER mix cyanuric acid with ordinary granular chlorine. It is a dangerous practice which can result in an explosion. If you are using stabilized chlorine on a regular basis, an excess of stabilizer levels will also have a detrimental effect on pH levels, but due to the prolific rainfall in New Zealand this is hardly ever a problem. Nevertheless, have the stabilizer levels checked annually.