

POOL OWNER'S MANUAL

- 2005/2006 -

**The essential guide
to the correct maintenance
of your**

cascade

swimming pool

Important Information!
Read this Manual!
Keep Handy as a Reference

Rev. 03.05



cascade

SWIMMING
POOL
SYSTEMS



www.cascade.co.nz

TABLE OF CONTENTS

Details	Page
Introduction	3
Payment Record & Pool Details	6
Completions (May be missing if has been used)	7
Producer's Statement (May be missing if has been used)	11
Lifeguard Roster	13
General Information	15
Cascade's Warranty page	16
Quick Start - beginner's guide to pool care	17
Water Test kit - the Yellow Test Kit	18
AquaChek 5-in-1 Test Strips	19
Pool Water Test Record Log	21
Everybody's Pool Vocabulary	22
Common Problems and Remedies	29
Pool Water Treatment	30
How to chlorinate your pool	32
Salt Chlorinators	36
Safety with Pool Chemicals	39
Cascade Pool Filtration System	41
The Aquagenie Skimmer/Chlorinator	46
Don't Block the Aquagenie built-in Overflow!	47
General Pool Care	48
Caring for your Vinyl Liner	49
Remove the pool cover once the swim season is over	50
Safety around Swimming Pools	52

**Shortcut to "Dont's" -
Familiarise yourself with these, so at least you know what NOT TO DO!**

Symbol Keys:

-  For your Information
-  Don't do this

Quickstart	17
Handling Hydrochloric Acid	27
Safety with chemicals	40
Multi-port Valve	43
Aquagenie overflow	47
Vacuuming pool	48
Don't with the Vinyl Liner	49
Pool Safety dont's	51



AquaTech Industries

AQUA*TECH

Manufacturer of fine swimming pools since 1974

COPYRIGHT NOTICE

This publication in its entirety is the copyright of Cascade Industries Limited, PO Box 17069 Greenlane and its author Laurence E (Larry) Ogden and is for the use of the customers of Cascade and owners of Cascade swimming pools. No duplication by electronic or other means is permitted without the express permission beforehand of the Author. E&OE, and Without Prejudice (C) April 2003

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



CHAMPION POOLS

Caprice
budget swimming pools!

NEW ZEALAND
GUILD MASTER
POOL BUILDERS

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





Thank you for your order for your own beautiful "Cascade" swimming pool. This is your Pool Owner's Manual, so may we suggest that you find a few minutes to sit down quietly somewhere and read through it. As you have obviously been given this manual, we assume that the installation process has either commenced, or is about to commence in the near future, and that very soon you will be enjoying the use of your pool.

The process of installing your pool will proceed as per the following schedule.

- We have drawn up the appropriate site plans and made applications for Building Approvals, which have been approved by your local City Council and should be on site.
- When Building Approvals are ready for collection, unless we have already done so, we will advise you of the amount the Council requires for a Footpath Crossing Deposit, and we will collect a cheque from you for the amount required. (This amount varies from \$500 to \$1,000 depending on which Council area you are in). The deposit is refundable to you once your fencing is completed and inspected by the Council and a final Compliance Certificate has been issued. NOTE: If there is any damage problem with the footpath at present, we advise you to take a photograph of it now - for future reference - so that you don't jeopardize the return of your money.
- At a pre-installation site meeting, our our Sales Representative hands you over to our **Construction Supervisor** who will be your contact with Cascade from this point on. Details are confirmed so that the project can be explained to the Installation Crew to ensure that any arrangements made between the Salesman and yourself will be upheld.
- On the day we start, the installation crew will arrive, the excavator and trucks (if needed) will arrive, all of the pool components will be delivered (except the vinyl liner, which will be manufactured exactly for your pool, and Heat Pump, which we will keep in storage until it is needed) and excavation will commence, which will take between 6 and 8 hours for normal size pools. At this time the "First Progress Payment" of the Contract Price is due. We do not operate Credit Accounts with our suppliers, so these funds will be used to purchase all the components used over the next five days and pay for the excavation.
- If Soil removal and truck hire is involved, our Supervisor will arrange this on your behalf. This cost is charged directly to you, so expect to pay around \$75 per hour/per truck, plus tip fees where applicable. Usually two trucks will be needed. If there is any question of the strength of the driveway (or neighbour's driveway) then you must use a smaller rubber tracked machine - such as a Hallitrax - to transport the excavated soil to the trucks waiting on the roadway outside your home. We tried "tailoring" the truck hire to the actual hours needed, but this didn't work out: They will expect a "full day's hire" and charge accordingly. Allow \$2,500.00 to \$3,000.00 for soil removal and disposal per day.
- Our Sales Representative will have explained that we are unable quote for any underground obstacle, such as rock etc. in advance of discovering it. If such a problem is encountered, an estimate will be given verbally for the costs of removal and rebuilding the pool base with cement stabilised scoria. We would like to stress that underground obstacles are not common in most areas, but in signing our Sales Agreement, you accept the liability for all costs to overcome any such problem.



- All swimming pools & spa pools require a Building Approval - which are part of our contract - and sometimes Resource Consents. Extra Consents or Application Fees are not part of our financial responsibility and must be paid by yourself.
- The team constructing your pool are Trained Installers who have been instructed by us on the installation of Cascade swimming pools, and while they are termed "subcontractors" they are really "piece workers" who are paid set rates for each pool installation. They are NOT "9 to 5" people, and will work to targets they set for themselves. This means you may not see them "at 8:00am each day" and they may be gone when you arrive home at night. The important thing is that they achieve what is required of them for each day on site, and complete the pool within the seven to ten days allowed. Some tasks may not be started if the 6:00am weather report forecasts rain (that may NOT eventuate) so there will be times they do not show up. The main thing to remember is that the pool WILL be constructed in accordance with our standards - so try not to concern yourself at the unusual hours our contractors work. If they fail to keep a promise to "come on a certain day" check the back cover of this manual for their direct cell phone number and ask them why, as we may not be aware of what they may have promised you, or their schedules.
- The Building Approvals must be kept on site and available for Council Inspection as required - typically the Local Authority will want to inspect the fresh excavation. When these inspections take place it is your responsibility to ensure that the Inspector signs off the plans, or at least note the inspection dates on the back page of this manual. Even if it is not "required by Council", we have experienced occasions where - some years down the track the Council "has no record of an inspection taking place" and refuses to issue a final Compliance (completion) Certificate. It pays to keep a record of inspections is kept on hand.
- Liners being made by ABGAL of Qld Australia, may be subject to a delay of up to 14 days in some cases, as measurements may need to be re-checked and weekends interfere with shipping schedules. These are top quality liners, so please try to be patient. We are certain you will be pleased with the finished job which will be well worth the wait.
- On completion of the pool shell, installation of liner, filled and filtering, the Crew will add Tri-Super-90 Stabilized Chlorine (Quadrachlor) tablets to the Aquagenie canister (when fitted) and they'll give the pool a shock dose of Granular Chlorine where it is not.
- The "Second Progress Payment" is now due. As we work on a C.O.D. basis with our suppliers and subcontractors, your prompt attention to this payment would be appreciated. The crew may be given this payment to bring to us together with the Cre Release (page 7) for authorising that the work has been completed up the "filled & filtering" stage.
- With "Champion" and "Classic" pools with "Registered" or overlap liners, there will be a delay of 6 - 10 days to allow the pool to stabilise until the Coping Installer arrives to fit the pool copings that you have chosen from the samples you have been shown. Pools with Hung Liners may have had the copings installed by this time, but not always. Cascade pools may have either Hung or Registered liners. If an ABGAL 770 liner (Made in Qld. Auatralia) is specified, be prepared for an up to 14 days (sometimes more!) wait for it to arrive.
- If the pool is "filled & filtering" it is important that you keep your pool "healthy" by looking after the chlorination while waiting for the opings to be fitted. Periodically add some of the Chlorine we have left with you - either Liquid or Granular, or if an Aquagenie Skimmer is fitted, ensure the Quadrachlor Tab Canister contains sufficient tabs for your pool - usually 8 to 12 tablets.
- **DON'T OVERDOSE** with stabilised tabs! Never fill the canister up completely!



- The pool water will be "Balanced" when the pH reads 7.6, the Total Alkalinity reads between 80 - 120, and the hardness is 200.
- Please read the chemical treatment section to familiarise yourself with the correct procedures. It is preferable to run the pool filtration 24 hours per day until the copings are fitted and your surround work is completed.
- As well as this Manual, you may find a Video CD on pool care.

Please view this as soon as possible, but be cautioned that these may give "Generic" advice not specific to Vinyl Liner pools. For example, they may show someone broadcasting pool chemicals into the pool - don't do this with a vinyl pool, as some chemicals may bleach the pool liner on contact. Always add all pool chemicals through the Skimmer (while the pool is running). For the same reason, "pool shop" advice may not be specific to vinyl pools - so be aware that different pool types need differing treatment!

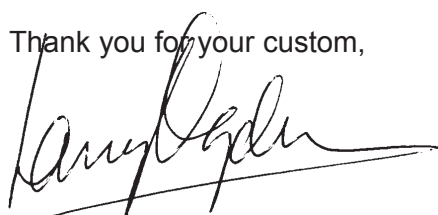
If there are any points about which you are unsure, please CALL US IMMEDIATELY - as a pool can "go off" really quickly in hot weather, and takes days (and Dollars) to get right again. WE CAN NOT STRESS THIS POINT ENOUGH! It is your responsibility once the pool is filled!

- If you have a pool cover on order, to avoid damaging it, we must wait until your surrounds are finished before unrolling it. As covers are not ordered until the pool is built, there will be a 7 to 14 day delay in the cover arriving. When first laid out, it will shrink approximately 1% or 150mm in length over the next few weeks, so don't trim it to final size prematurely. If you need help trimming it, please call us, and we will come and do it. Ensure the cover initially "stays put" by weighing it down at the edges, but be careful not to use bricks or coping stones that may "flap" into the pool and cause damage to the pool liner if the wind gets under the pool cover before it is trimmed.
- Finally, when the copings have been installed, we are finished, and the pool is ready for you to enjoy. If you feel that the manuals and videos aren't enough, call us anytime for explanations.
- A comprehensive training session (Handover) on the maintenance of your Cascade swimming pool by our Installation Supervisor or another qualified pool person will be given at a time to suit you. Please make a booking with your Supervisor. The pool cover can be trimmed at this time, if required. The "Final Payment" is now due, so please give it to the Handover person, or send it in by the 20th of the following month and we will validate your Guarantees.

Caring for a pool can be quite comprehensive, however if you don't "get it" the first time, don't worry: by studying the Pool Owner's Manual and watching the Videos, it should not be too difficult for you to understand. If not, a call to our office will soon get you on the right track.

Please bring the following section to the attention of the Supervisor who will ensure that the details have been filled in correctly, as this forms part of your WARRANTY - and helps us keep a record of the pool equipment used on your pool,

Thank you for your custom,



Laurence E (Larry) Ogden - Dip Pool Tech NZMPBG (Hon)
Managing Director
CASCADE SWIMMING POOLS



Payment Record

Pool Number _____ Contract date: _____ Installation commenced : _____

Sales Rep: _____ Contract Total: \$ _____

Deposit \$ _____ PAID _____ Date _____

1st Progress \$ _____ _____

2nd Progress \$ _____ _____

Final \$250.00 _____

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

DETAILS OF POOL (To be filled out by Cascade Representative)

Original Owner _____

Street _____ Suburb _____

Building Approval # _____ Approvals Given to Owner _____

Dealer Name _____ Service Contract No _____

Range _____ Model _____ Size _____ Capacity _____

Filter Brand _____ Pump Brand _____ Watts _____

Crew _____ Supervisor _____

Xtras included: _____

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

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 _____



POOL CONSTRUCTION RELEASE FORM (Part One of Two)

Pool # _____

Customer Name _____

Crew _____

Please complete this form and give it to the crew to bring into our office so they can be paid for their work.

The **Second Progress Payment** of \$ _____ is due at this time, so by signing this form, you signify that you are satisfied with the pool installation up to this point, the Installation Crew have completed their part, and you will give the Progress payment to them to bring in, so we can pay them.

Please tick all relevent boxes.

The pool is **filled and filtering**

The initial **Pool Chemicals** have been added

There is, or

there is no **Rubbish to remove**

I have the **Pool Owner's Manual**

I require a **Training Session** on pool care

The pool has had an initial **Vacuum**

I have given the **Progress Payment** to the Crew

Payment Received by _____

(Crew Team Leader)

Signed by

Customer _____

Date _____

OFFICE USE ONLY

Crew: Supervisor must countersign this form: Bring it in with the Progress Payment to be paid your Installation Fee

Model _____
Extras _____

Rate \$ _____
\$ _____
\$ _____
\$ _____

Total Due \$ _____
Tax \$ _____

NET AMOUNT \$ _____

Supervisor _____ (Approved for payment)

< cut here >

FINAL COMPLETION CERTIFICATE (Part Two of Two)

Pool # _____

Customer Name _____

Coping Installer _____

The **copings are installed**

The pool has been **vacuumed of coping cement**

The offcuts have **been removed**, or ...

need to be ... removed from the site

Comments on the performance of Cascade Swimming Pools:

Signed by Customer: _____

Date: _____

Comment by Cascade supervisor

Stamp

cascade

PO Box 17069
Greenlane
AUCKLAND 1105

IF UNABLE TO HAND TO CREW, PLEASE MAIL BACK TO US

Fold and tape closed

Stamp

cascade

PO Box 17069
Greenlane
AUCKLAND 1105

IF UNABLE TO HAND TO CREW, PLEASE MAIL BACK TO US



CUSTOMER'S REPORT For Pool No: _____

Hand -or- Mail to: **Quality Control Manager,
Cascade Industries Limited**

WE ASK THAT YOU TAKE A FEW MINUTES OF YOUR TIME TO COMPLETE THIS FORM
SO THAT WE ARE ABLE TO ENSURE THAT OUR PERFORMANCE AS YOUR POOL
COMPANY HAS BEEN A SATISFACTORY ONE.

NAME & ADDRESS OF JOB: _____ _____	THE CUSTOMER DATE: _____
General Comments regarding CASCADE & the installation of my swimming pool: _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	

Areas that I believe Cascade could improve:

Things that need to be done before I consider the job complete:	Tick when done:

As all the items noted above have been addressed, I consider the job complete. The final payment has been made, and the Warranty page activating the guarantees has been duly signed by a Cascade representative.

Signed by: _____ (the Customer or Customer representative)

Print Name: _____ Date: _____

Signed by: _____ (for Cascade)

Stamp

cascade

CASCADE INDUSTRIES LIMITED
PO Box 17069, Greenlane
AUCKLAND 1105

Attention: Quality Control Manager

SECOND FOLD

FIRST FOLD

PRODUCER STATEMENT PS-3

CONSTRUCTION REVIEW



Issued by **CASCADE SWIMMING POOLS LIMITED**

TO _____ DISTRICT/CITY COUNCIL,

IN RESPECT OF THE INSTALLATION OF A CASCADE SWIMMING POOL

AT _____

LOT _____ DP _____

BUILDING CONSENT No _____

CASCADE SWIMMING POOLS LIMITED, the pool component manufacturer and supplier, confirms appointment of CASCADE CERTIFIED INSTALLER _____ to monitor the construction of a CASCADE swimming pool as specified in the Drawings and Specifications prepared by **George Downey Structural Engineer** and/or **Airey Consultants** any other documents according to which the swimming pools is proposed to be constructed, of the _____ (Model) inground vinyl-liner pool, and being a duly authorised agent of CASCADE SWIMMING POOLS LIMITED and current member of THE NEW ZEALAND MASTER POOL BUILDER'S GUILD with a minimum of TEN YEARS experience in swimming pool construction, I confirm that I have sighted the Building Approvals and any attached conditions of building consent, and BELIEVE ON REASONABLE GROUNDS that all of the conditions have been completed to the extent required by the said building consent, and by reason of my Certification by CASCADE SWIMMING POOLS LIMITED (Certification Number ____/____) in the construction of their swimming pool system and my experience in and knowledge of the construction thereof and in my opinion confirm that a Code Compliance Certificate be issued in respect of this installation.

Signed _____ (NZMPBG Membership No _____)

Date _____, 200 ____

stamp here

_____ CITY COUNCIL

PRIVATE BAG _____

Attention: RESIDENTIAL BUILDING CONSENTS

FIRST FOLD HERE

SENDER:
CASCADE INDUSTRIES LIMITED
PO Box 17069, Greenlane 1105

SEAL WITH TAPE BEFORE MAILING

SECOND FOLD HERE



LIFEGUARD DUTY ROSTER

Pool Doors opening onto the pool area must be closed and locked at all times a Duty Lifeguard is not present in the pool area

Day	Duty Person	From	To

USE ERASABLE WHITEBOARD MARKER

www.cascade.co.nz

A Lifeguard on duty is permissible according to the terms of the Fencing of Swimming Pools Act 1987

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 electrically powered 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.

Small to medium size pools	up to 35 kilolitres	750 watt Pump Motor
Middle size pools	45 kl & up to 80 kl	1000 watt Pump Motor
Large pools	80 kl & up to 120 kl	1250 watt Pump Motors
Larger pools	over 120 kl	1500 watt Pump Motors - or a dual 1000w setup

Time Clock

A plug-in or Hard Wired or plug in time clock is included with your Cascade pool, and you may want this bypassed for pool maintenance during "off" times, so ask the Electrician about fitting a bypass. The time clock feeds the 3 pin outlet that the pool pump(s) are plugged into.

Pool Lights

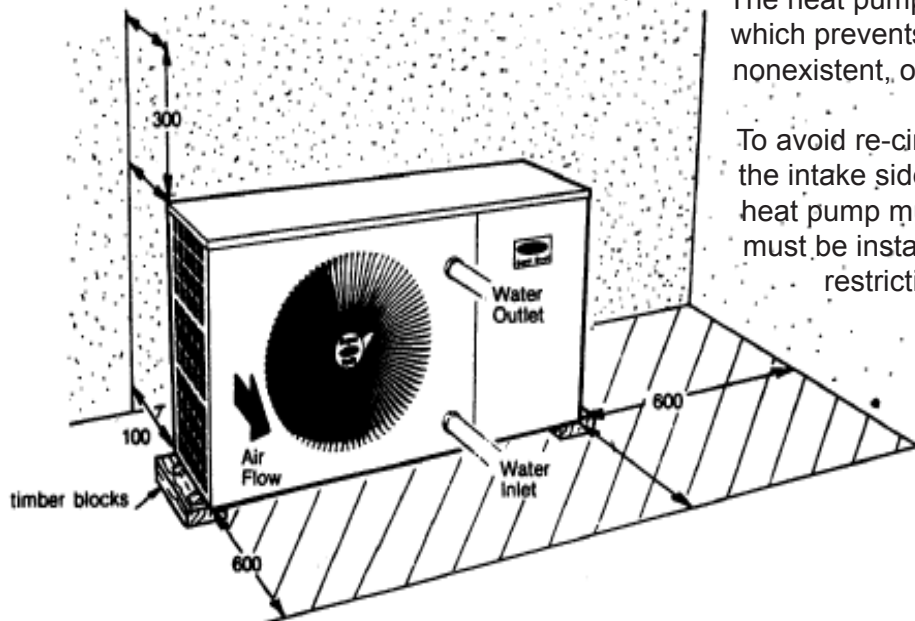
Normal size pools usually have lights a pair of lights, and include "240v to 12v" transformers housed in drip-proof stainless steel boxes. The lights are either 100 or 150 watts and come with 6.0m of cable. If the cable length is altered, lights may not function as intended due to voltage variation. The Electrician should be able to calculate wire gauge should any addition be required. Most people like to switch the pool lights on and off from within their house, so inform the Electrician if you want to do this.

Heat Pumps

Heat pumps vary in power requirements depending on the model. Although not strictly necessary for the smaller models, it is usual to hardwire the Heat Pump into the electrical supply.

Here are the values for typical units

Mfg	Model	Volts	Noml output	Kw Input	Run Amps/Phase	Fuse/Amps
HWH	151	220-240	6 Kw	1.2	6.0	15
Carrier	Oasis 10	220-240	10 Kw	2.0	9.0	20
HWH	226	220-240	11 Kw	2.2	9.6	25
Carrier	Mirage 15	220-240	15 Kw	3.2	16.0	30
Carrier	Mirage 25	380-415	25 Kw	5.1	11.0	20



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.





General Information

NOTE: Learn the 1-2-3-4 chemical maintenance routine!

The care and maintenance of your new Cascade swimming pool is simple and rewarding routine, but there are a few points relating to Water Care and pool water chemistry that need your attention and understanding.

This Cascade Pool Owner's Manual is intended as a reference manual to assist your understanding of the many facets involved in healthy pool water maintenance.

We have been constructing swimming pools in New Zealand since 1970, and as you may sell your property at some future date, please keep this manual for your own use, and the use of the new owner.

The Twentyfive Year Structural & Twenty Year Liner Manufacturer's Warranty (which relates to the manufacturing quality of the product)* is transferable to any new owner within the first ten years of the installation of the swimming pool, providing we are notified of the change and have the opportunity to inspect the pool.

If your pool is fitted with an AQUAGENIE system, be sure that your paving does not cut off the inbuilt drain which is intended to keep the pool from over-filling and also avoids saturating the chemical dispenser when the pool is not running, which avoids highly chlorinated water spilling out the skimmer mouth and staining the liner.

Should any problems occur that are not covered by this manual, please contact Cascade at the telephone number shown below.

Quick Reference:

Your Cascade Sales Representative is: _____ Telephone No _____

Your Local Pool Serviceman is: _____ Telephone No _____

Leaking Gas Emergency : **0800 80 9000** (If Gas Heater fitted)

Poison & Hazardous Chemical alerts: **0800 764 766** (Chlorine spill/gas emergency)

Rescue Services **111**

* The liner warranty covers welding and material quality. The warranty does NOT cover:

- (1) **✗ Physical damage:**
 - (a) Damage caused by incorrect or improper chemical useage!
 - (b) Damage by cutting or any mechanical means!
 - (c) Leaving the Pool Cover on over winter and "cooking" the liner with overchlorination!
- (2) **✗ Fading of printed patterns:**
 - (a) Overuse of chlorine (a bleach) could prematurely fade liner patterns
 - (b) As in (1. c) Above
- (3) **✗ Vinyl Growth:** Folds or creases appearing caused by a consistently low pH
 - (a) As in (1. c) Above

With correct care, your liner should last 25 years!

READ THIS MANUAL - LEARN HOW TO LOOK AFTER YOUR POOL LINER AND YOU WILL BE REWARDED WITH MANY YEARS OF ENJOYMENT OF YOUR CASCADE SWIMMING POOL!



Cascade Swimming Pool Warranty

Cascade swimming pool components are manufactured by AQUA-TECH LIMITED for Cascade Swimming Pools and 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".

Providing the components are installed by an Authorised Dealer in accordance with the provisions of the Building Approval issued by the Local Government Authority and with the plans and specifications of the designer and Registered Engineer, and installed in normal non-acidic and well drained soil conditions and subsequently maintained in accordance with the guidelines for correct chemical and sterilisation procedures, the seller (in accordance with the provisions of the Consumer Guarantee Act 1992) warrants and guarantees the following:

ULTIMATE STEEL/CONCRETE SHELLS carry a twentyfive year structural suitability guarantee

CLASSIC WALL PANELS manufactured from zinc-electroplated steel will remain structurally sound and suitable for the intended use for a minimum period of twenty years

CHAMPION WALL PANELS manufactured from zinc-electroplated steel will remain structurally sound and suitable for the intended use for a period of ten years.

CAPRICE WALLS manufactured from Colorsteel carry a five year structural suitability guarantee.

All Wall Module Guarantees or warranties are voided if the pool is fitted with a Saline Chlorinator and/or installed in acidic soil conditions, **unless a further treatment** of Polyester Powdercoating is undertaken by Cascade prior to installation of the component.

INTERIOR MOSAIC TILE BANDS and pool edging stones carry three year workmanship guarantee.

POOL LINER SEAMS will remain free of defect and remain structurally intact for a period of TWENTY YEARS. The warranty does not cover physical damage, either by cutting or inappropriate chemical treatment or abuse, fading, colour change, chemical wrinkling, low pH symptom, or any other effect resulting from causes beyond the control of the seller.

WORKMANSHIP & INSTALLATION of the components is unconditionally guaranteed to be free of fault or defect for a period of THREE YEARS

FILTRATION EQUIPMENT The pool filtration unit is unconditionally guaranteed against Manufacturing defect for TEN YEARS providing that it is housed in such a manner as to be protected from weather & elements. The MPV (Multi-Port Valve) is guaranteed for ONE YEAR

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

POOL LIGHTS and Transformers are guaranteed for ONE YEAR. Bulbs carry no warranty, but will be replaced by us if they fail within ONE YEAR of installation

This Warranty is issued by the reseller. If any claims arise, under the terms of the Consumer Guarantee Act, you must contact the company that sold you the equipment, and be aware that any warranty is limited to workmanship & mechanical defects and not "wear & tear". The warranty period commences on the date of the installation of the components and will not apply while any payments are outstanding

Equipment Validated By: _____

Signed _____

Being a duly Authorised Agent of Cascade Swimming Pools

Date _____

QUICK START: If nothing else ... be familiar with these basic principles!

Please read the entire Pool Owner's Manual, but if you can't find the time, here is a "quick start" lesson on pool care. Ensure the pool fencing is secure BEFORE filling the pool! Temporary fencing IS AVAILABLE for rental for a few dollars per month/per section. BE SURE YOUR POOL IS SAFE!

1. **When the pool is first filled, (before the surrounds are finished) ensure that the filtration unit is operated 24 hours per day.** There is more debris and nitrogenous waste going into your new pool at this time than after the surrounds have been completed, so extra filtering is needed at this time. We recommend 24 hours a day until the surrounds have been completed, and at any future time when the water gets out of balance and green.
2. **The 1-2-3-4 Chemical Routine!** Correct chlorination is based on the 4 elements of a properly Balanced Pool.
 - (1.) pH range of 7.2 to 7.6
 - (2.) Chlorine Residual of 1.0 ppm
 - (3.) Calcium Hardness of 200
 - (4.) Total Alkalinity of 80 to 160 (120 is ideal).

By maintaining these values, and you will have a "happy" swimming pool! If you have an Aquagenie system, use ONLY Tri-Super-90 Tabs available from Aquatech or the Cascade web site! NEVER break up the large Tri-Chlor tabs to fit!

3. **Do NOT overload the Aquagenie Canister.** The Tri-Super-90 tabs are stabilised with cyanuric acid, and will create "cyanuric lock" and a green pool - even though there is chlorine present. **DO NOT USE MORE THAN THE RECOMMENDED QUANTITY OF TRI-SUPER-90 TABS FOR YOUR POOL!** This is usually 8 to 12 tabs, depending on pool capacity. Filter the pool for 12 hours daily in summer months and superchlorinate regularly. If the pool is not being used daily in summer due to inclement weather, or in winter months, **remove the pool cover** and reduce both Tabs by 2/3rds and Time 3/4 to avoid excessive chlorine buildup and possible damage to the pool liner.

4. Superchlorinate Regularly - **pools should be "shock dosed" every 7 to 10 days during summer**, if the pool is being used constantly - esp. by "little kids" who create more work for the Aquagenie. Read the manual for details, but rule of thumb is: tip **1 to 2 liters of Liquid Chlorine or 1 to 2 cups** of Granular Chlorine into the pool skimmer while pool filtration is running. Don't swim for 20 minutes.

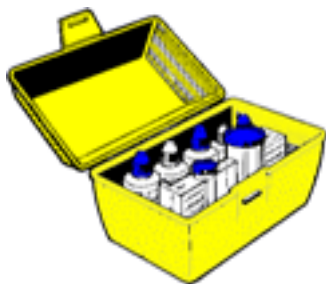
5. **Winterise your pool after the summer season is over.** Cut the filter timer back to 2 - 4 hrs daily, reduce the chlor Tri-Super-90 tabs to between 2 and 4, **remove and store** the Heat Retention Cover to avoid chlorine buildup and possible liner damage.

6. Be cautious of **"Pool Shop Advice"**. Some pool shops do not understand all the different types of pool finishes available today, and may give you inadvertently misleading - or even contradictory - advice. It's better to **read this Cascade Pool Owner's Manual, and find out our proven method of caring for Aqualon/Vynide interior swimming pools.** Some overseas pool products are too harsh for our liner pools - superchlor is one - and DONT broadcast anything into pool - despite what it might say on the packet or container!

7. **Backwash the Filtration Unit periodically.** When first started, the pressure gauge will read the optimum pressure for your pool (a range from 0 to 1.0 usually) when the pressure increases by .7 to 1.0 it's time to **BACKWASH** your pool filter. Turn OFF the power, rotate the Handle on the Multiport Valve (on top of the tank) to the Backwash position, turn ON the power. Wait until the water runs clear (through the sight glass provided) the power OFF turn to RINSE power ON for 5 seconds, power OFF turn to FILTER position, power ON! Congratulations! You have just backwashed your filter!

8. **As a Cascade pool owner, you are automatically enrolled in our Pool Owner's Club** - and can purchase all chemicals and accessories at discount prices. Log onto www.cascade.co.nz - navigate to Pool Club web page. Password is "poolclubmember" (lowercase, no quotes) Chemicals can be couriered to Auckland customers.





HOW TO USE YOUR YELLOW 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 Yellow 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

Aqua-Tech Industries

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
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

<p>1. CHLORINE TEST</p> <ol style="list-style-type: none"> 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. <p>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.</p>	<p>2. pH TEST</p> <ol style="list-style-type: none"> 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). <p><small>NOTE: If result is above 7.8 save sample for ACID DEMAND test. See next box for details on how to determine acid demand.</small></p>	<p>ACID DEMAND (TO LOWER pH)</p> <ol style="list-style-type: none"> 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. <p><small>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).</small></p>	<p>3. TOTAL ALKALINITY</p> <ol style="list-style-type: none"> 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 	<p>4. CALCIUM HARDNESS</p> <ol style="list-style-type: none"> 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.
--	---	--	---	--

on-line pool chemicals - www.aquatech.co.nz Fax:(09) 634 0049 Tel:(09) 636 9921
Aquatech Limited 75 The Mall, Ohelonga Auckland 1105 e&oe(c) 3/2002

See general Information on the care of vinyl liners on the reverse of this sheet

GENERAL INFORMATION

The Aquatech VYNIDE and 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

Rotary type automatic pool cleaners are better suited to vinyl pools than reciprocating types - call (09) 636 9921 for details



You may find this in your pool kit instead of the YELLOW test kit

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.**

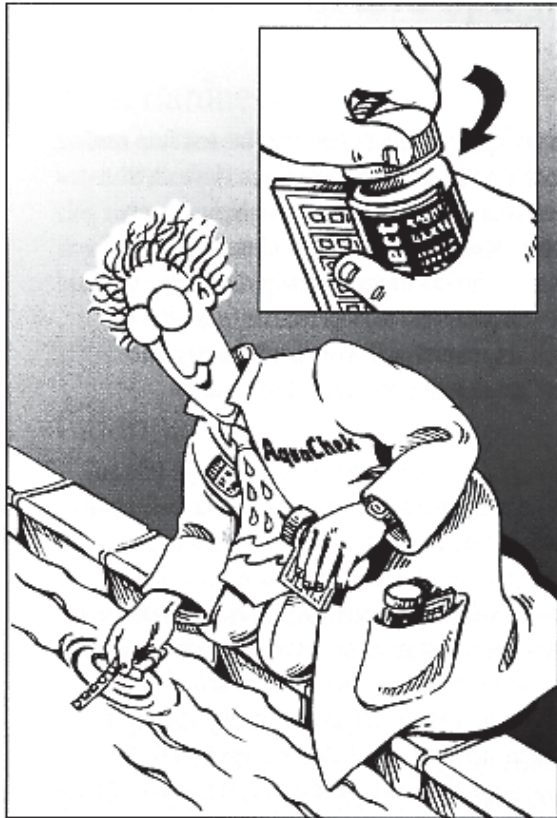
Simply dip a strip into the pool,
and you're almost done! hold the
strip level with the comparator,
and that's it!

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



**TURN PAGE
FOR INSTRUCTIONS**

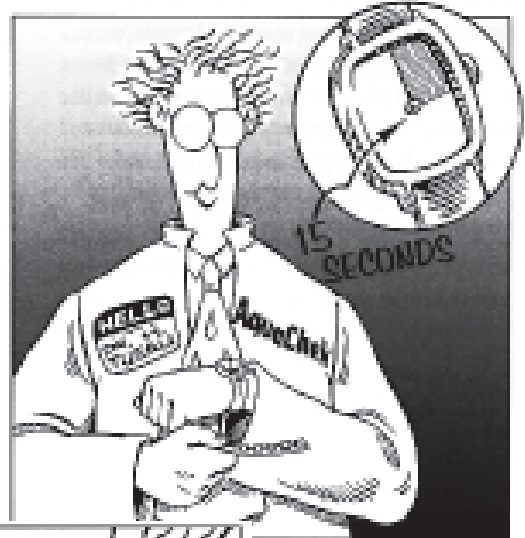




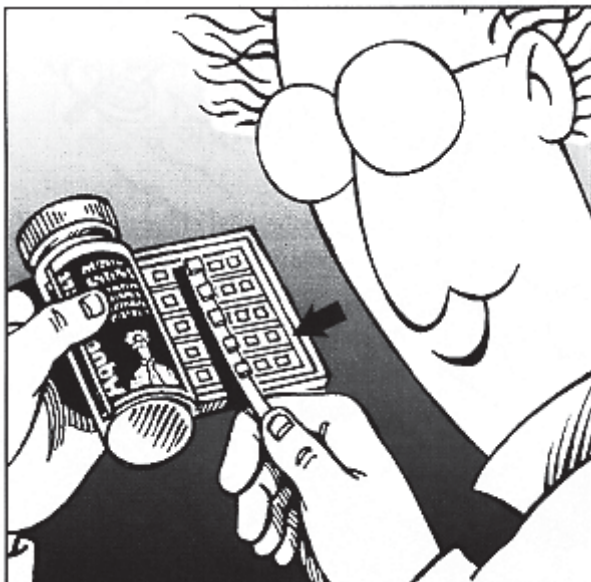
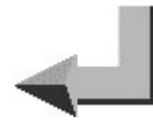
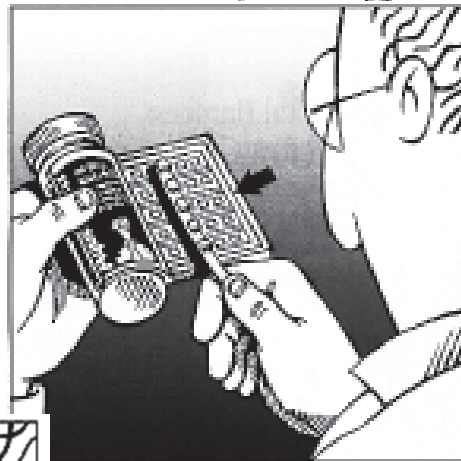
Dip the Strip, then



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!**



EVERYBODY'S POOL VOCABULARY - it's informative to read through this!

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 aka "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 (Bi-carbonate) 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 (ie 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 oostystic 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 pool-side 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-Chloro-S-triazine-trione tablets (Quadrachlor - aka 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. Aka 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 (aka Granular Chlorine) is a powdery substance similar in appearance to chalk. It can also be found as a lower yield Sodium Chloride (aka 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 (aka 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:

Aka "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 leaves and hair that got through the skimmer basket. Aka 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 (bi-carbonate 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 litres, the calculation is even simpler: multiply pool length by breadth by average depth for cubic meters of water. One cubic meter is 1,000 litres -or- 1Kl. Eg a 5m x 10m pool with average 1.5m would be ((5 x 10 = 50) x 1.5 = 75) or 75,000 litres.



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".

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 chloride. 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 (ie 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

Also known as pH Increase, or sodium bicarbonate

STABILIZER:

A special chemical agent (aka Cyanuric Acid) which when applied to pool water in recommended amounts, slows the dissipation rate of the chlorine residual. Normally the cyanuric acid level should not exceed 200ppm

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. Aka "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 re-balancing the pool will outweigh the small amount of power usage during winter.

TURBIDITY:

A measure of cloudiness in water due to the presence of contaminants. 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 steps that are Armourguard treated)

If you have older walk-out stairs fitted to your pool (pre 1998), 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 build-up 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.

Since 1998 Cascade walk-out steps have been protected from black spot by the addition of Armourcote surfacing, which keeps the pool water away from the fiberglass.

*** 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.**

Pools fitted with fibreglass components (or fiberglass pools) must be treated differently to concrete or vinyl liner pools.

- Maintain pH between range 7.0 to 7.2
- Maintain Total Alkalinity at 180ppm
- Maintain Chlorine level at (less than) < 1.5 ppm FAC (Free Available Chlorine)

Maintain the pH as indicated (above) and you will not have any problems. If your stairs are Armourcoated, this will not apply (ie only the white stairs are vulnerable)

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 fiberglass 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.

Here is a general guideline for the three main pool types:

	FAC	pH	TA	CH
Fiberglass	0.5 - 1.5	6.8 - 7.2	80 - 160	0 - 100
Concrete	1.0 - 2.0	7.4 - 7.6	120 - 160	400 - 500
Vinyl Liner	1.0 - 2.0	7.2 - 7.8	80 - 160	200

Key: FAC Free Available Chlorine
 pH Positive Hydrogen - a measure of acidity - alkalinity
 TA Total Alkalinity
 CH Calcium Hardness

New Zealand water is mostly generated from rainfall, which "distills" the water thus reducing the dissolved miners 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.

A generalised graph of water balance is called a Taylor Watergram.

Remember that your pool type may require slightly different values.

Ideally, the pool water for a vinyl liner pool should be in the range 1.0 - 7.6 - 120 - 200 for FAC pH TA and CH which we refer to as the "1-2-3-4" regime. You will have been given a "Quickstart" page to hang in your filter shed, and possible a Fridge Magnet to remind you of these values.

Vinyl Liners will exhibit longer life if the pool is kept to the 1-2-3-4 regime

IDEALLY, KEEP YOUR CASCADE VINYL LINER POOL TO THESE VALUES:

	Range	Minimum	Ideal	Maximum
FAC	1.0 - 2.0	0.5	1.0	3.0
TA	80 - 120 ppm	80	120	160
Ph	7.2 to 7.6	7.2	7.6	7.8
CH	150 - 300 ppm	150	200	300



COMMON PROBLEMS AND REMEDIES.

Although described fully elsewhere, this brief summary may help with troubleshooting. For quantities given both imperial and metric values are shown (Metrics in brackets) as some pool chemicals are sourced from non-metric countries.

1. Persistent Black spots or black algae occur:

Caused by high pH, lower with Hydrochloric Acid to 6.8 and keep it there for 4-5 days while keeping up filtration and chlorine dosages. Raise pH again with pH increase (soda ash).

2. Pool water turns a greenish colour (but not immediately after chlorination):

Water is overly acid, inadequate filtration or insufficient chlorine being used. Check pH, if acid, add pH increase to bring pH to level 7.2 - 7.6. If chlorine shows low, super-chlorinate with 1 1/2 oz of chlorine per 1,000 gallons of pool water (250g to 10k Litres).

3. If pool becomes hazy or turbid:

High pH or filtration period is inadequate and/or not enough chlorine is being used. Check pH and adjust to 7.2 - 7.6 with pH decrease. If correcting pH does not clear water within 1 hour, super-chlorinate as in 2.(above) May also be due to inadequate filtration, so filter 12 hour per day.

4. If pool water turns milky and/or green colour when chlorine is added:

High pH or insufficient chlorine, check pH and correct. Check chlorine dosages are correct for pool gallonage, superchlorinate to raise chlorine residual and then correct daily dosages.

5. If pool water becomes brownish or reddish in colour when it is chlorinated:

Indicates iron present in the water, however, if pH and chlorine levels are correct

6. If pH readings don't seem correct or don't register:

This may apply with chlorine readings too, the reagents in your test kit may be off, they do deteriorate and it is advisable to buy fresh ones each year. Don't use pool strips.

7. If dirty water is returning to the pool:

Filtration plant has not been backwashed long enough, or the pool has been vacuumed with the MPV on BACKWASH which has deposited pool debris on the wrong side of the maindrain (and which will blow back into the pool when the MPV is returned to FILTER position

8. Low or no Total Alkalinity showing when tested:

Total Alkalinity should be adjusted before pH as the pool pH is affected by TA. Correcting the TA with Sodium Bicarb will nearly always correct the pH

9. Pine needles or other debris blocking pump impellor:

Use a Skimmer Sock inside the skimmer basket to make the straining action more efficient. These are available from Aquatech (09 636 9921) or your local pool shop.

If at any time the liner appears to be "loose" or wrinkles develop, check the pH immediately, and take steps to INCREASE the CALCIUM HARDNESS to 200 and TOTAL ALKALINITY to at least 120. Prolonged low pH may damage the pool liner. This situation may arise when the pool is covered for prolonged periods, with too much chlorine being produced and not dissipated by use of the pool, sunlight etc. and may happen in wet, warm summers.

99% of pool problems arise through inadequate chlorination or incorrect pH.

In pools correctly maintained, few problems will arise.



POOL WATER TREATMENT.

① There are two primary requirements in maintaining pool water ...

- **Chemical treatment**
- **Proper filtration.**

Both of these functions must be performed ... one cannot be substituted for the other. It's hard to believe that drinking water which seems pure and sparkling in a glass, needs further processing and treatment to make it ideal for good swimming, but it's true! Tap or drinking water may be turbid enough to obscure the pool bottom, and it is only after several passes through the filter that it will become clear and sparkling. Exposure to the air can precipitate cloudiness in drinking water and once exposed to air and sunlight the pool will become home to millions of algae and bacteria which will flourish and multiply unless checked with chemical treatment.

Chemical Treatment:

The most useful method of sterilizing pool water is by the addition of "Chlorine". In it's natural state, chlorine is a yellow-green, odorless gas, but does not exist on it's own - more usually as a compound like sodium chloride NaCl. At concentrations of 2.5 or more, chlorine gas will damage human mucous tissue (throat, lungs), and in fact was used in WWI as an anti-personnel weapon. (So DONT inhale it!)

Sounds unfriendly, but it's a very useful element.

Chlorine is a member of the HALOGEN family. You may be familiar with the other useful family members: Iodine, Bromine and Fluorine. All are used in the elimination and treatment of bacteria.

OZONE:

What about Ozone? Ozone is a far more effective method of killing bacteria - to the order of TEN TIMES more effective than chlorine, but unfortunately it's almost useless in treating swimming pools as it has no effect on Algae - so you have a "safe" pool that is green!

An ideal situation, would be to treat the pool water with both Ozone AND chlorine. However you add the chlorine - liquid, powder, in tablet form, electrolysis from saline water, or stabilized with isocyanurates - it remains the most convenient and safe method of treating your home swimming pool.

Since about 1950 the gradual adoption of the principle known as 'breakpoint' chlorination, as compared with the earlier tenet of marginal chlorination for swimming pools, has resulted in bringing chemical treatment to a new level of simplicity and effectiveness.

The use of chlorine as a sterilising agent is essential in swimming pools to control the bacterial count of the water caused by human wastes such as urine, perspiration, saliva, hair etc. coupled with atmospheric pollutants, insects, bird droppings, leaves and surface run-off during storm rain conditions are primary causes of pool contamination.

These nitrogenous wastes give rise to nitrogen, some of which is in the pool water at all times. Chlorine in the pool water will combine with nitrogen to form other chemical compounds all "Chloramines". When all the chlorine in the water exists in this form this is termed "marginal chlorination", and



the chloramine products of this are called "combined available chlorine".

When chlorine exists only in this form, the resultant rate of sterilisation of newly introduced contaminants is very much slower than that obtained by chlorine in the uncombined form or "Free Available Chlorine" (FAC). Some types of chloramines are objectionable to bathers, giving rise to eye and skin irritations and the so called odour of chlorine.

Oddly, this "chlorine smell" as it is incorrectly termed, is a main reason why people object to a "chlorinated" swimming pool - often asking for a "Salt Pool" to eliminate this problem!

Of course, a "Salt Water Pool" contains water treated with sodium chloride or salt which is chemically converted into **sodium hypochlorite** or "liquid chlorine". An equal amount of **sodium hydroxide** is also created, which is the reason that "Salt" pools always have a high pH which needs constant attention.

Modern pool hygiene lays emphasis on the desirability of maintaining chlorine above the marginal level (or "breakpoint") which exists as free chlorine and this is known as "free available chlorine" or FAC. The resultant sterilization can be up to 50 times more effective and all unpleasant irritants and odours will be eliminated. Regular daily treatment, using sufficient chlorine at the end of each swimming period or at sundown (whichever is the later) will result in progressive destruction of chloramines.

Algae:

These are forms of plant life which are present on vegetation in the air and in soils. These microscopic spores are continuously introduced into pools by wind, rain showers etc. Algae from objectionable slime, interfere with proper filtration and are difficult to remove from pool sides and bottoms.

If an adequate free residual chlorine level is maintained at all times, algae cannot exist. However if circumstances have permitted algae to grow, it is possible for them to acquire immunity to normal breakpoint chlorination levels and it is necessary to apply shock treatment to bring back normal healthy water conditions. This is achieved by a method known as "superchlorination", in which three to four times the normal daily dosage of chlorine compound is used. Ususally, in the hot - but sometimes rainy - Auckland summer weather, it is prudent to superchlorinate every 7 to 10 days if the average temperature is over 25° Celcius.



For pools equipped with the AQUAGENIE skimmer/feeder, you may skip this section

How to Chlorinate the pool.

The questions of how - when - why? Have been dealt with. We will now refer to the questions of what to use, how much and how to administer and establish the required dosage.

1. Calcium hypochlorite is the chemical required. The purest form has 70% available chlorine. Granular Chlorine Compounds are specially prepared to suit your Cascade pool. Avoid the use of cheap or little known brands.
2. The required dosage is determined by the following factors;
 - a. Capacity of pool in liters. (Width x Length x Average Depth)
 - b. Bather load - each swimmer entering the pool uses some of its chlorine residual & introduces contamination. More swimmers = more chlorine.
 - c. Water temperature. Higher temperatures exhaust chlorine residual more rapidly and enhance algae growth, creating a greater demand for chlorine.
 - d. Rain showers and wind. Both introduce atmospheric contamination in the pool and dilute its chemical system, creating a higher chlorine demand.
 - e. Direct sunlight accelerates the dissipation of chlorine.
 - f. Foliage. Debris from adjacent trees, flowers, shrubs grasses etc. Contribute algae, spores, leaves, pollen and associated wastes to stress the pool chemical system.

IMPORTANT:

The pH of the water must be checked and, if necessary corrected before chlorinating the pool.

The pool water must be balanced in accordance with the Taylor theory

Pools may be operated with the water stabilized or unstabilised. Different levels of residual chlorine are desirable for these two conditions. (Refer to par. Entitled "Pool Stabilisation").

Most of these factors (a) to (f) preceding are variable and day by day chlorine requirements can only be determined by semi-regular chlorine residual tests using the test kit or Dip Strips supplied with the pool. The chlorine residual reagent (DPT Tabs) supplied will react with the water specimen to yield a variety of pink (or yellow, with some other types of kits) shades. Colour comparators are also supplied with numbered spots or bands of colour against which the water/reagent mixture must be matched **within 10 seconds of mixing**. The number against the matching colour on the comparator will indicate the chlorine residual. If residual chlorine is present in the water at the time of taking the test, delay in matching will allow the chlorine to **bleach the reagent dye** to a lighter shade or even colourless. Some kits include a reagent to stop this happening.

This would give an impression of lower residual chlorine than the actual level and would result in unnecessarily heavy dosage. Before testing for chlorine residual rinse the test tube in the pool and then obtain the specimen from approximately 300mm below the surface. The readings obtained are in chlorine parts per million parts of water. (ppm) Lower and upper residual limits are between 0.6 ppm and may be as high as 2 ppm. Unstabilised pools should be held between 1.0 and 2.0 ppm while stabilised water requires a residual between .75ppm and 1.5ppm and preferably near to the higher figure.



3. The instructions on the granular chlorine container will include information on how to convert ppm into actual weights per 1000 litres of water. However, as a general guide, 10 grams per 1000 litres is approximately equivalent to 1ppm available chlorine. This should be the initial dosage for new pools or for pools being opened for the season. The filter should be operating at the time of chlorination and should continue to run for several hours. It is important to note that bathing should not be permitted until the residual has dropped to a maximum of 2ppm.

4. Administer granular chlorine in the following manner: Add the required amount of chemical directly into the Skimmer while the pool filtration system is running. **DO NOT BROADCAST GRANULAR CHLORINE DIRECTLY INTO THE POOL**, as bleaching of the liner may occur! After normal chlorination the filter should be left running for at least 2 hours to ensure adequate distribution in the pool.

5. Maintenance of Chlorine Residual.

An evening dosage, carried out daily should maintain a satisfactory residual level in unstabilised pools. This dosage should be added whether the pool is in use or not. When the test kit indicates that some residual is present, topping up may be calculated on the basis of 100 grams per 10,000 litres to raise the residual by about 0.5ppm. Topping up with small quantities to cope with increased bathing density or long periods of bright sunlight may be carried out during the day providing the method described in par. 4 is used. However, it is advisable to terminate bathing for up to half an hour from the time of introduction of the chlorine.

6. This is a method of quickly increasing the residual chlorine content of pool water. It is sometimes necessary after long periods of intense sunlight, high temperatures or periods of rain and high winds, which may load the pool with debris and pollen. This should be done in the evening in the manner already described in par. 3 and using the same dosage as for pools being opened for the season. It is recommended that during the pool season you should superchlorinate at fortnightly intervals when average afternoon temperatures are below 25 deg C and at weekly intervals when temperatures exceed this level. This treatment will "burn out" odours and tastes which tend to accumulate in pool water due to the presence of chloramines ("combined chlorine").

7. Shock Treatment - or "Superchlorination".

This is necessary to counter the growth of semi-resistant Algae. These are plant life, the microscopic spores of which are in the atmosphere at all times and are constantly being introduced into swimming pools by rain, wind and other inclement conditions. Growth rate increases rapidly as pool water temperature reaches 20 degrees Celsius, and in "swimming temperatures" of 25 or more will increase as organic wastes from swimmers stimulate growth.

There are various types of algae the most common of which are called green and black.

The green (floating) type can multiply with great rapidity making an alarming change to the appearance of a pool and the filter system may become partially clogged, slowing down water recirculation.

The black type can grow simultaneously with the green and is very resistant to treatment. Slime forms on pool sides and bottoms and clusters known as algae spots which are difficult to remove adhere to the surfaces.

Due to texture and neutrality to chemical etching Cascade liners are less susceptible to algae adherence than any other form of pool wall. In fact, although algae can form on a Cascade liner, the very nature of the liner prohibits the algae from establishing itself in the pool surface. Regular attention to



chlorine residual and pH readings in the correct range will completely inhibit algae formation but it should be borne in mind that only regular testing will give this protection. They are only visible to the eye when levels of approximately 30,000,000 spores per oz are reached. This is already very fertile ground for bacterial growth, and prevention is better than cure - which often involves considerable expense and may necessitate closure of the pool for an appreciable period while it is being treated.

Shock treat with a dosage of 1 oz of granular chlorine per 500 gallons in the evening (100g to 10,000 liters). On the following morning brush the walls and bottom to loosen the algae and vacuum the pool. Introduce the chlorine as described in par. 3 and leave pool unused until residual level has dropped to 2ppm or less. Check pH before and after shock treatment correcting in either case if necessary. Algae occurs most commonly during prolonged absences from home due to vacations or sickness or similar causes. Every effort should be made on these occasions to have your pool regularly dosed by a serviceman or neighbour. Note! Stabilized pools, preferably covered with a pool cover containing an ultraviolet screening pigment, will resist algae growth for longer periods and will require less frequent dosing to maintain in a healthy condition.

PH Explained.

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.

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 10 seconds of mixing.

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. (7.2 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 atleast 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.

i 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.

i 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.

NEVER MIX ANY POOL CHEMICALS TOGETHER AS A FIRE OR EXPLOSION MAY OCCUR!

SALT CHLORINATORS

Electrolytic Saline Chlorinators produce liquid chlorine from common salt. This liquid chlorine then mixes with the water in the pool or spa and oxidizes bacteria, algae and organic matter in exactly the same way that it would if added to water from a container.

Swimming Pool Salt is Sodium Chloride especially produced and packaged to use with automatic chlorine generators for domestic and commercial swimming pools.

SALT CHLORINATORS PRODUCE CHLORINE FROM SALT!

How they work:

Because the chlorinator cell is a closed system, the Acid Chlorine produced is neutralized by the alkaline sodium ions produced. The overall reaction is a splitting of the water and salt molecules releasing hydrogen gas and producing NaOCl or sodium hypochlorite. In the pool the oxygen is given up in oxidizing and the hypochlorite is once again reduced to salt.

An equal amount of sodium hydroxide is also produced. This is unfortunate, as it has a pH of 14.0 and severely affects the pool pH. As a high pH will affect the effectiveness of chlorine, it is necessary to

reduce these to acceptable levels of 7.2 - 7.6 by adding acid to the pool. Unfortunately, the addition of acid will eliminate the water hardness and total alkalinity, so you will have to bring these levels back



up with the addition of sodium bicarbonate and calcium chloride.

What started out in 1971 as a "simple way to chlorinate pools" has turned into a morass of chemicals and specialist treatments, so the use of a Saline Chlorinator is not encouraged by Cascade.

Salt is lost only by pool water loss or splashout, and amounts to about a third of the initial amount each year - depending on your local rainfall figures.

Salt levels are normally in the range 2,000 to 8,000 parts per million, or .02% to .08% (Sea water is approximately 20,000ppm)

ADVANTAGES OF SALT IN SWIMMING POOLS

The advantages of salt in swimming pools apart from the sanitizing effect are:

1. The pleasant "soft" feel of the saline water.
2. Lack of red eyes from prolonged bathing in manually & often under chlorinated pools.
3. Asthma and hay fever sufferers can now swim in and under water without adverse symptoms caused by chloramines ("tear gas" or "bad eggs" smell) in underchlorinated pools.
4. No need for daily dosing of Granular Chlorine into the pool (Daily in the swimming season, weekly at other times)

The mild saline content of the water has no effect on the Cascade vinyl liner, and negligible effect on marble plastered cement pool finish. In the case of marble finish pools we prefer to delay the addition of the salt for up to four weeks until the pool finish stabilizes. Copper components maybe affected by the saline water.

DISADVANTAGES OF SALT CHLORINATORS

Salt is a highly corrosive substance and will be damaging to:

1. Pumps - Crystallization of salt residue will reduce water-seal and bearing life
2. Unprotected Zinc-Electroplated Steel Walls (should be polyester powdercoated)
3. Coping edging stones - will crystallize and split the surface - guarantees voided
4. Adjacent gardens, plants, lawns and fishponds (will kill goldfish)
5. Salt residue remains on skin - requiring a shower after pool use
6. Warranties on pool equipment will be voided or reduced
7. Production of sodium hydroxide (pH of 14) means acid needed to lower pH
8. Using Acid destroys TA and CH in pool - means adding SODA ASH and Calcium
9. Not as "convenient" as first thought due to increased chemicals needed to balance pool!
10. Bags of top-up salt are awkward and heavy to handle - 60 Lbs each (25Kgs)
11. Salt Cell needs periodic cleaning with Hydrochloric Acid (See POOL VOCABULARY)

HINTS FOR CHLORINATOR OWNERS:

1. Operate the Filter Pump and Chlorinator continuously until the water is clear and the required chlorine residual is reached (Each pool differs).
2. Adjust the combination of running time and control knob setting to maintain this chlorine residual. Check the chlorine residual with your test kit frequently over a period of, say two weeks to obtain this combination. It will vary for summer and winter requirements.
3. Maintain the pH as closely as possible to level as recommended for your pool
4. Check the benefits of using cyanuric acid (pool conditioner) which will act as a "sun screen" and prevent premature deterioration of the residual chlorine levels.
5. Check the levels of salt, cyanuric acid and total alkalinity, at the start of summer, after periods



of heavy rain, or after experiencing a considerable water loss from the pool through prolonged backwashing or lowering the pool level.

6. Learn how to do the chlorine production test at the return to pool outlet, as well as the chlorine residual test. The difference in readings indicates the amount of chlorine the Chlorinator is producing.

N.B. If chlorine levels in the pool drop below safe levels, shock dosing or superchlorination to a level of about 10ppm may be necessary. This can usually be achieved by running the chlorinator for 24 hours or adding chemical (Liquid) chlorine.

SALT CONCENTRATION:

Salt concentration for Chlorinators available today range between 2000ppm (.02% by weight) and 8000ppm (.08%). Since at concentrations below these levels the chlorine production will drop off, it is important to "top up" the pool with new salt periodically. Note that salt concentrations above 8000ppm may cause an overload and may damage the Chlorinator, so check the manufacturer's Manual before adding any salt - Most importantly do not switch the chlorinator on again UNTIL the salt is fully dissolved in the pool water. (This may take several days)

An average sized pool is 55,000 litres = 55,000 kg x .002 = 110kg or 5 x 25kg bags (at 2000ppm or 0.2%)

(To obtain Kilos at .4% by weight = Litres x .004)

(To obtain Kilos at .6% by weight = Litres x .006) etc.

TOP UP:

Each time the pool level is topped up with 5,000 litres (1,100 gallons) water, also add -

At 0.2% concentration - One half a 25kg bag of salt.

At 0.4% concentration - One full 25kg bag of salt.

At 0.6% concentration - One and a half 25kg bags of salt.

INSTRUCTIONS FOR ADDING SALT TO THE POOL:

1. Before adding salt to the water, be sure to turn the chlorinator OFF and (if possible) unplug it from the wall to eliminate accidentally turning it on while the Salt concentration is above the maximum allowed.
2. Calculate the number of bags of pool salt required, using the chart above. It is always best to add a little more IE to the next bag up.
3. Adjust the pool filtration system to the normal filtration cycle mode.
4. Cut open the bag and scatter the salt evenly over the surface of the pool. Agitate the water with the Pool Brush attached to the Vacuum Handle until the salt is dispersed. (This may take several attempts over a day or two)
5. Do not backwash the filter for at least two days after adding the salt - by which time it should be fully dissolved.
6. Operate the pump continuously after adding salt to help dissolve it.

USE ONLY REFINED SWIMMING POOL SALT!



Conversion Factors:

To convert	Multiply by
Kilograms to pounds	02.205
Pounds to kilograms	00.454
Grams to ounces	00.035
Ounces to grams	28.350
Litres to gallons (Imp.)	00.220
Gallons (Imp.) to litres	04.546

APPROXIMATE CONVERSIONS:

120,000 litres	= 25,400 Imp. Gallons
150,000 litres	= 33,000 Imp. Gallons
40 grams	= 1.4 ounces
25kg	= 55lb
25 deg. C	= 78.8 deg.F.

TO OBTAIN 0.2% SALT CONTENT:

Use 1 x 25kg bag of Pool Salt per 12,500 litres (or 2gm per litre).

TO OBTAIN 0.6% SALT CONTENT:

Use 3 x 25kg bags of Pool Salt per 12,500 litres (or 6gm per litre).



NOTE:

This information was supplied by Dominion Salt (NZ) Ltd who accept no responsibility for the incorrect use of information or for the incorrect use of salt for the purposes contained in this publication.

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

✗ 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 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!

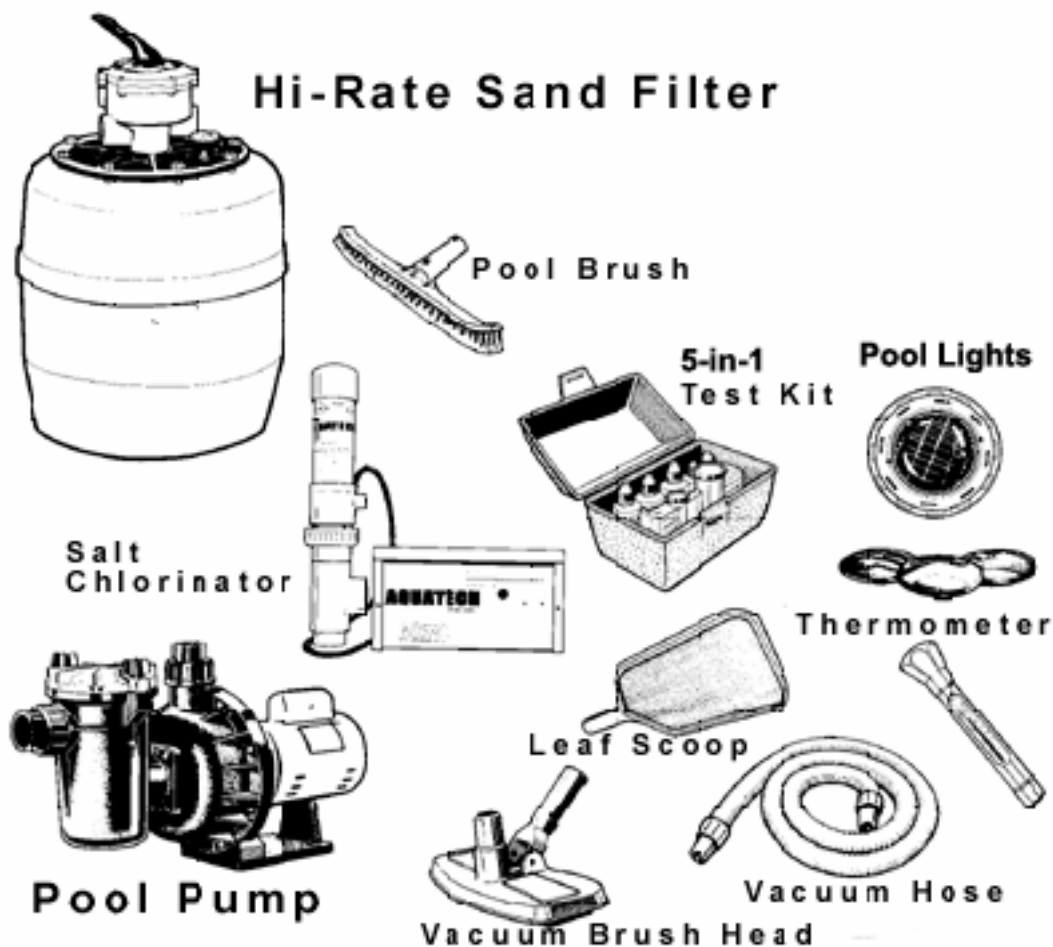
✗ DO NOT STORE POOL CHEMICALS NEAR PETROLEUM BASED PRODUCTS

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

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



THE CASCADE 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.

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 timeswitch 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

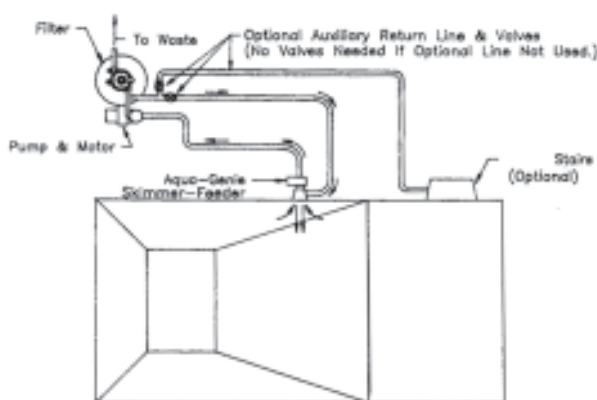
Water passes over the skimmer weir trap, a hinged floating flap, which adjusts to slight varying water levels, caused by heavy rains, evaporation, backwashing etc. It also adjusts to splash and turbulence created when the pool is in use. It is biased in the normal flow direction and its purpose is to 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 actual return outlet in the pool is positioned just below the normal water level 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.

FILTRATION LAYOUT (Typical)



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 water level it may be necessary to prime it in order to eliminate air from the system at starting up time. Usually the pump will self prime in a few seconds if only a small amount of air enters the system when the pot lid is removed. 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 co-incidentally 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 over-tightening. 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 (aka 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.



✘ 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 by-passes 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 by-passes the filter, returning to the pool through the inlet fitting. Thus, maximum flow is achieved. Mainly used as a check position by servicemen.

DONT'S

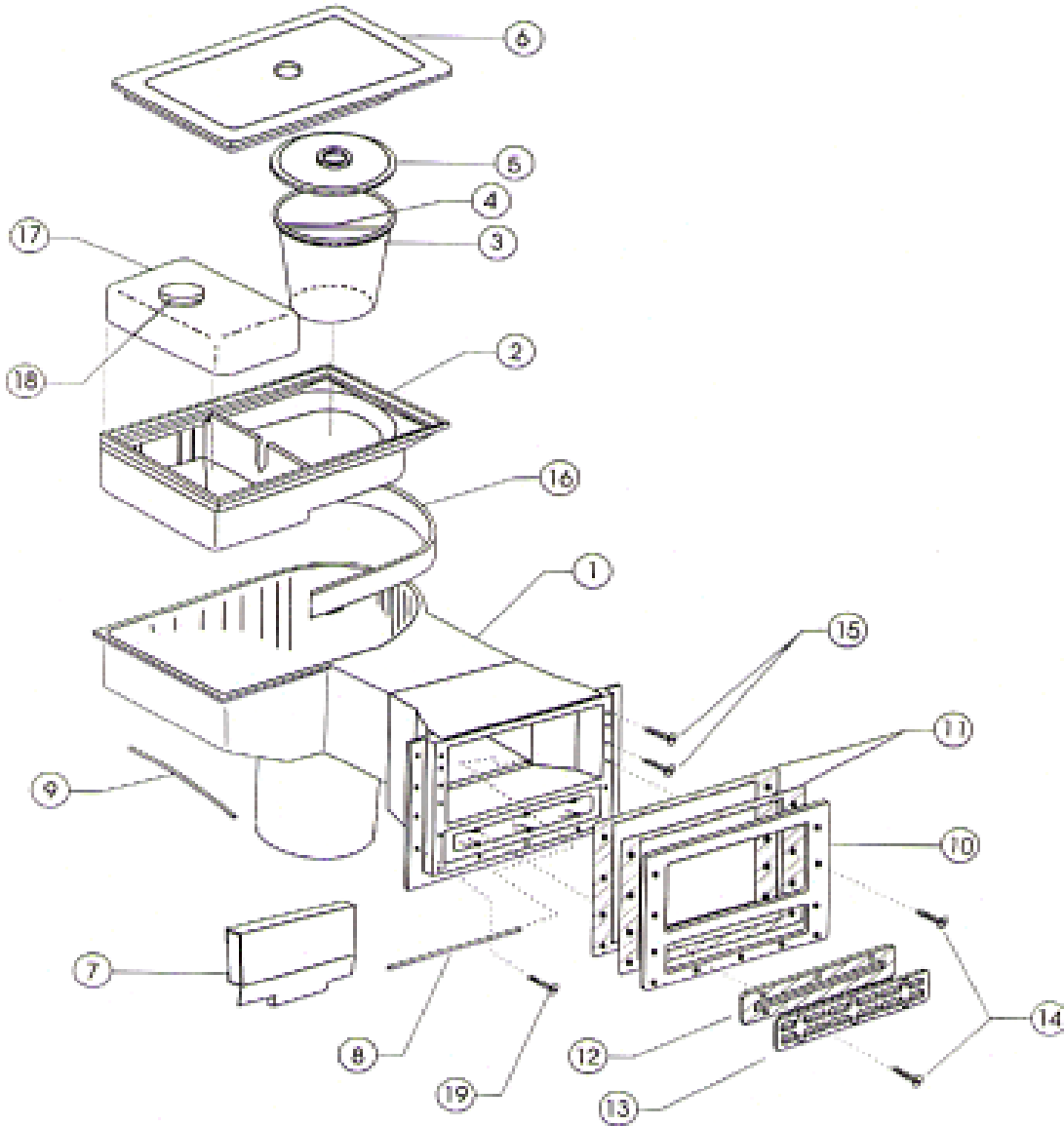
- ✘ NEVER vacuum with the control valve on backwash.
- ✘ NEVER alter valve positions while pump is running.
- ✘ NEVER vacuum with other than a vinyl-liner pool brush (as supplied with pool).
- ✘ NEVER vacuum with a broken vacuum brush.
- ✘ NEVER allow the pool water to drop below the level of the bottom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



The AQUAGENIE SKIMMER

The Aquagenie is a combination Skimmer/Chlorine Feeder

Fitted to all Classic and Ultimate pools since 1996, the Aquagenie is a major breakthrough in pool care and chlorination



The Reservoir contains a canister that will take Tri Super 90 stabilized chlorine tablets. The usual quantity is 8 - 12 in a pool that runs 12 hours daily in summer months.

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 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 Cascade Pool Owners Club.
- ✘ Don't ever use TRICHLOR tabs in the skimmer basket (see 3 below)
- ✘ 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 it is clear by running a thin blade or fingernail from left to right - but if you use a knife, be careful not to slip and cut the pool liner!



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



- ✘ 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!

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 VINYL LINER

The Aquatech "Sanitized" Vynide or Aqualon .550 and .750 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.

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 CANOES, OR FIBREGLASS SURFBOARDS crashing into the liner
 - ✘ USE ACRYLIC GLASSWARE AROUND THE POOL - it's sensible and avoids cut feet
 - ✘ USE ONLY 3M SCOTCHBRITE and JIFF to clean scum line
 - ✘ Don't use metal scrubbing pads on printed pattern liners
- ① DISCOURAGE DOGS FROM SWIMMING (They're dirt magnets, anyway)

The 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 (aka 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 Chlorine 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.

WINTERISING:

If resident in a temperate zone not subject to sharp frosts winter preparations are minimal. In fact, the pool may be required on occasions particularly if a heating plant is added to the equipment. if however, winter usage is infrequent a pool cover can help to cut down on pollutants entering the pool, and the need for vacuuming. Unless the pool is used at summer density, and heated to summer temperatures, the chlorine required will drop drastically and will in fact be minimal.

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



REMOVE THE POOL COVER DURING NON-SWIMMING MONTHS

- to avoid a buildup of chlorine in the pool, and possible damage to the liner.

If heavy rain occurs and threatens to cause the pool to overflow the level can be reduced by using the filtration plant to pump to waste. Remember however, that in heavy and persistent rain it is sound practice to keep the pool water level as high as practicable. If the pool is not subject to winter freeze the filter unit must be run regularly in order to prevent damage to the pump and motor. We recommend using a time control switch and a minimum running period of 2 hours per day. In "water freeze" areas, winterizing the pool before frost sets in is a must. The recommended procedure is as follows:

1. Remove any portable accessories and store for the winter.
2. Vacuum thoroughly, remove all leaves and wash the liner above the water line.
3. Backwash the filter thoroughly.
4. Heavily chlorinate at the rate of 3ozs per 500 gallons of pool water. Run the filter for several hours following chlorination.
5. Expansion and contraction during "freeze" periods should be negated by placing 2 or 3 large soft, preferably inflatable, beach balls in the pool water prior to covering the pool.
6. Apart from those times when the pool water is solidly frozen run the filter regularly, preferably 2 hours per day.
7. When starting the pump after freeze periods, or when it has been shut down for prolonged periods, exercise caution. If the pump motor does not start immediately do not persist in trying to start. Call your local electrician. To do otherwise could result in serious, expensive, damage to the pump motor.

Opening the pool in spring is relatively simple regardless of whether it is situated in freeze or non-freeze areas.

1. Remove any covers placed over the pool during winter months and any articles placed in the pool to allow for expansion and contraction.
2. Establish the pool water at normal operating level.
3. Start the filtration system. Care with the pump motor should be exercised as in paragraph 7. preceding. If the water level has been lowered during the winter it may be necessary to refill the hair and lint pot and re-prime the pump with water.
4. Vacuum the pool thoroughly.
5. Check and adjust the pH level.
6. Check and super-chlorinate pool water.
7. Add stabilizer (Cyanuric acid) if required. The addition and control of stabilizer will result in lower chlorine usage.

The pool is now prepared for use.



POOL SAFETY

- ✗ Try to avoid swimming when alone.
- ✗ If you must, avoid any potential accident by restricting yourself to a 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 non-breakable.
- 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.

INSIDE THE POOL

- ① 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!.
- ① Establish sensible pool rules at the very beginning; enforce them constantly and firmly.
- ① 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.
- ① Be careful of inflatable toys and mattresses. Remember those items are also deflatable.
- ① Provide responsible adult supervision at poolside at all times.
- ① Pools are like driving a motor vehicle: They don't mix well with alcohol. Keep inebriated guests out of the pool and poolside area.
- ① Never swim alone or allow others to do so. Sudden cramps can occur even in the most accomplished swimmers. NEVER let kids swim alone!!!!
- ① 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.
- ① Exercise caution when diving from tiled decks and only dive at the deep end.
- ① 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 2,100mm (7'0") - 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 non-slip surface is always in good repair. Don't allow running on the board, or any horse-play!
- 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.

Yours faithfully,



Laurence E (Larry) Ogden - Dip Pool Tech (Hon NZMPBG)
Managing Director
Cascade Swimming Pools Limited



Cascade Pools Installation Checklist

Pool Number

Customer Name _____	Mobile # (02 ___) _____
Sales Rep _____	Mobile # (02 ___) _____
Project Manager _____	Mobile # (02 ___) _____
Crew Boss _____	Mobile # (02 ___) _____
Coping Installer _____	Mobile # (02 ___) _____
Excavator Operator _____	Mobile # (02 ___) _____

INFORMATION FOR CREW

Pool Type: Caprice Champion Classic Ultimate Other _____

Pool Model _____ Size _____ Shape _____ Liner/WOS Color _____ / _____

Special Shape/Size? Description _____

Standard Depth Special Depth? Special Depth Detail _____

Any Upgrades? Liner: to _____ Skimmer to: _____ Tall Walls Salty

Anything unusual (From Sales Agreement) _____

Extras

WOS Lights Tileband Chlorinator InfillFoam Cleaner Heat Other _____

Check that these items have been ordered

Installation Details: Items required ...

Digger Trucks Bobcat Halitrax Rockbreaker Temp Fencing Other? _____

Machine Access OK? Details of Access _____

Is any Wood Required to protect paving? Remove any Fence? Other _____

Pool Owner's Manual given to Customer?

INFORMATION FROM SITE SUPERVISOR

Pool Kit Delivery booked Date Required _____ Damage Check Site? Existing Damage?

NOTE EXISTING DAMAGE _____

Check Permit for Council Inspections? Inspection Booked Date Inspection booked for _____

Hydrant Required? Tanker Fill Water Permit? Water Permit No _____

Filtration commenced Date filtration commenced _____

Coping Samples delivered? Date Coping Samples Delivered _____

Site Cleanup by Crew? Handover by _____ Date _____

Supervisor Inspection/Comments:

Damaged or Missing Components _____

Signed off by Supervisor _____ Name _____ Date: _____