

# USER MANUAL OF SWIMMING - POOL



How best look after about its swimming - pool





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**Dear owner swimming - pool,**

boast of each of owner swimming - pool is glass clear and health unexceptionable water, in which is joy bath. To pellucid and hygienically unexceptionable water retained throughout bath season, have to keep several principles.



Team workers firm Aldapool wishes to all his consumers much beautiful years full untroubled fair weather near glassclear swimming - pool.

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## GENERALLY

Every healthy man and after thorough shower take to the waters million bacteria. Untended warm water in swimming - pools is ideal nutritive soil for growth eyelashes and bacteria. Eyelashes though aren't on the instant harmful for bather, but are it micro-organisms that may be of service bacteria and mushrooms like substrate. Eyelashes does water unaesthetic, blur she and constitute accident hazard incurred slippery day and sides.

### BACTERIA

Bacteria are very small, mostly unicellular organisms that the can be after his resemblance divided to the four basic kinds:

- ball - shaped „coca" – are it author pneumonia, inflammation cerebral membranes, ulcerous disorder, and so on (pneumococcal, meningococcal, staphylococcus, streptococcus)
- baculiform „coli" (red pestilence, tubercle, diphtheria)
- spiral „spirochaeta" (syphilis)
- sickle - shaped „vibriony" (cholera)

Numerous bacteria are equipped flagella, with their by the help of in water well move. Reproduction of bacteria is action dividing. In favorable environment and behind favorable conditions is able to come dividing after 15 – 20 minutes. It means, that e.g. on segmentation after 20 minutes originate from one's bacteria during 200 minutes 1.024 bacteria, during 400 minutes 1 048 576 bacteria and during 800 minutes (i.e. 13 hours 20 minutes) 1 099 511 627 776 (over billion) bacteria!!!

This instance has show, how extremely they may bacteria on favourable conditions mimeograph. Favourable conditions stand by 15° - 40°C, then is concerned temperature incumbent on in consideration for water in swimming - pools.

### VIRUSES

Viruses are of the essence less than bacteria. Virus isn't organism and isn't consisting of cells, but is concerned group big molecules. Viruses nerve and cannot separately mimeograph. Are reliant at his reproduction on live cell man, animal, herbage or micro - organism. Infiltrate into to them and will force she put out new viruses. Is- if created sufficiency new virus, cell will go viruses will disengage and raid new cell.

Some disorder can be developed heterogeneous viruses one's insider. There has been e.g. 30 types of virus that cause cold (rhinoviry), 40 types of virus that the lead to influenzal virus with grave do, swallow, larynx, respiratory pipe, bronchioles and pneumonia (adenovirus).



## **CILIA**

Eyelashes are the simplest herbage that we know. Grow cilia are increasing in the same way as with bacteria with in plant temperature, namely above proportional. Cilia are reproduction sexually or generation spats as reproduction according to different mechanisms. Spats of cilia as seeds may hang on long times. Together with dust particles may be spreading in the air as flying matters. So happens to bring into broil eyelashes to the swimming – pools.

## **FUNGI**

Fungi are how unicellular, so and more cellulate live creatures as herbage, but without their possibilities photosynthesis. Fungi are lives organic materials, like e.g. cutaneous fungus – degradation cellulate weaving leather.

Reproduction takes place mostly unisexual - budding, spore production and break up mildew grains to the single sentinel node. I mildew spats they may stay on quick like spats eyelashes all age and they may endure cold and dry atmosphere. Today is known c. 200 000 microbial kinds fungi, from that is c. 100 kinds for man infectious. Best known is mould of legs are progressing in damp and warm spaces, e.g. on swimming-baths and in showers. Candida albicans limps not only outer skin, but can cause local infection in the area mucous membrane mouth, swallow and anal or vaginal areas.



## PRINCIPLES

### FILTRATION, MECHANICAL OF FILTRATION

Every swimming-pool, having- if be clean and health unexceptionable, have to be equipped with arrangement for recirculation and adjustment waters. Way service line and waste pipe of water have to interlock thorough mixing waters from filtration with water swimming-pool reactor. Water inlet from swimming-pool suggests and does so, to was enabled water inlet on converter how from surface, so from gout swimming-pool.

Capacity filtration arrangement has to be such to water in swimming-pool theoretically filtered minimally 1 x behind 5 o'clock. By private swimming-pools is advises water filtered minimally 2x – 2,5 x every day.

To filtration swimming-pool water essentially use 3 kind of filtration:

- sand
- cartouche
- alluvial

Every of these three kinds have various pro and con:

#### 1. SAND FILTRATION ARRANGEMENT

It is most widely used to filtration arrangement to filtration swimming-pool waters. Like the filling use to special clean silicious of sand. Contamination of water from swimming-pool pass through from above down filtration vessel with sand, junks are sand of filling captured and cleansed of water flows back to the swimming-pool. Of course at sedimentation impurities increases pressure (resistance) in pipeline and so is necessary the filtration regularly check and with the aid of 6 way valves regularly sand pan off. At this „flooding" goes through water by filtration vessel from below up and dirty water then flow out except swimming-pool to the drainage.

Sand filtration at using sand about granularity 0,4 – 0,8 mm (recommended granularity) cash junks greater than 40 – 50 microns. At using flocculate it is possible filtration efficiency heighten on 5 –10 microns.

#### 2. CARTOUCHE FILTRATION ARRANGEMENT

It is filtration arrangement that use to filtration special cartouche of inset (polyethylene). Dirty water from swimming-pool goes through cartouche of filtration and junks are catch cartouche of inset.

After filling (sooting) cartouche of inset (again increases pressure in conduit) is filtration will put aside by the help of valves, simply dismount covering of filtration, will take out cartouche of inset and clear to jet of water. On clear cartouche of inset again will return to the filtration.

Filtration operation: junks greater than 10 – 20 microns without using flocculate.

### 3. ALLUVIAL FILTRATION ARRANGEMENT

This filtration arrangement is use to first there, where are gigantic titles to clean water. To filtration is use special synthetic woof cloudy of construction at what is silt kieselguhr.

On sooting filtration, when will rise pressure in pipeline as sand filtration by the help of 6 way valve will carry out flush filter. Part kieselguhr must fill in on every flush. Minimally 1x yearly advises filtration put aside, dismantle and properly clean.

Filtration operation: junks greater than 1 – 5 microns without using flocculate.





## TREATMENT AND DISINFECTION OF WATER - THEORY

To water in swimming-pool wasn't shortly after filling swimming-pool turbid water and full of cilia, but also after a few months stayed crystal clear and hygienically unexceptionable, must to the water continuously add appropriate resources **care of water**.

### WATER DISINFECTION IN SWIMMING - POOL

Below disinfection waters in swimming-pools is understands mortification micro-organisms. In private of swimming-pools use above all productions separation of chlorine, because not only killed cilia and bacteria, but currently export defiling matters.

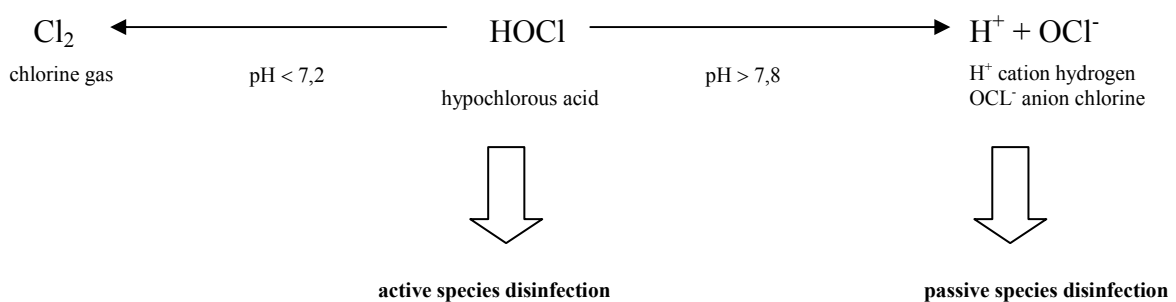
Dose quantity desinfectant depend upon water temperature, insolation, to the value of pH, mechanical pollution and load swimming - pool.

If water temperature is rising, pilling embryos by chlorine is increasing too. This reality is for disinfection favourable, because mounting temperature (15 – 45°C) increases and reproduction bacteria. On top increases and solubility organic porter chlorine and at the same time faster eliminate chlorine.

At extremely high water temperature and insolation (30°C) it is necessary take on regard, that the run out part slack unused chlorine. Therefore near outside swimming-pool advises do chlorination best evening. Surplus chlorine it is necessary especially choicely check by the help of „tester" swimming-pool reactor waters.

While using of all chlorine of preparations, creates two print of free chlorine, one of which works quickly and be effective (hypochlorous acid – HOCL) and second works slowly and is ineffective (hypochlorite ions – OCL<sup>-</sup>).

Hypochlorous acid HOCL disinfects water so that oxidate inorganic and organic contaminant of matters in her included. Her disadvantage is chemical unstability, largely depending on pH waters ⇒ at low pH (<7,2) releases chlorine gas and at high pH (> 7,8) happens to dissociation on cation hydrogen and anions hypochlorite that the have weak disinfection effects (see picture).



**At pH 8,0 be merely 20 % created of free chlorine effective!!!**





## CHLORAMINES

At oxidation acids hypochlorous acid (HOCL) with organic impurities, that are either natural character or is to the swimming-pool reactor waters take swimmers (cosmetics, preparation on hair, perspiration, leather, urine etc.). Rise nitrogenous allied substances give name chloramines. Chloramines in water smell bad after chlorine, titillates eyes, mucous membrane and drain skin. They may implicate allergy. Have very low disinfection effect, therefore it is necessary carry on their concentration what lowest level.

In most of lands they decrease content of chloramines in the water frequent water renewal in swimming - pool (about 5 %), so mainly chemical analysis, so - called super - chlorination. At super - chlorination happens to chemical analysis chloramine on fluent nitrogen and acid hydrochloric. To achievement super - chlorination to the swimming - pool have to swear - word next chlorine in quantities that the matches 10- the multiple chloramine (blocked chlorine).

General chlorine – free chlorine = **combined chlorine (undesirable)**

Instance show by the help of values on tester **Aqua Check 7 land 1** and use **Attack Chlor Chock 65 g** about content chlorine 55 %.

General chlorine	= 10
Free chlorine	= 0,5
Blocked chlorine	= 1 – 0,5 = 0,5

Swimming - pool about proportions  $3,5 \times 7 \times 1,5 = 36,75$  rounded 37

$0,5 \times 10$	= 9,1
$55 \times 0,01$	
$37 \times 9,1$	= 336,6 g

To fulfillment super - chlorination it is necessary to the swimming - pool adds 0,336 kg shock symptom chlorine Attack Chlor Chock 65 g.

Surely there's no need remind of, that the in execution time super - chlorination and subsequently as far as until at decrease content of free chlorine on unstrung appreciate, in swimming - pool mustn't it anybody bath.

Rate of free and blocked chlorine in water not only depend upon content contaminant materials, but also on quantity swear - word chlorine. While using small quantity chlorine forms in water above all fetid chloramines.

In interval 0,5 – 0,7 g/m<sup>3</sup> happens to degradation chloramines and organic chlorine of adducts from waters. Only from funds c. 0,7 g/m<sup>3</sup> swear - word chlorine, after over fulfillment faulted point then happens to growth of free chlorine and lowered production chloramines. It's reason, why in many countries advises content of free chlorine round 1 g/m<sup>3</sup>, namely nevertheless, that inform negative impingement upon human organisms. Behind long way more dangerous than higher content of free chlorine consider high content chlorine blocked – chloramines that they have mutagenic effect.



In public notice 135/2004 Sb. be laid down max. content of free chlorine. Near swimming - pools on 0,3 – 0,6 g/m<sup>3</sup>. Z of the above follows that the near public swimming - pools it is necessary do variation waters earlier than those was in former times.

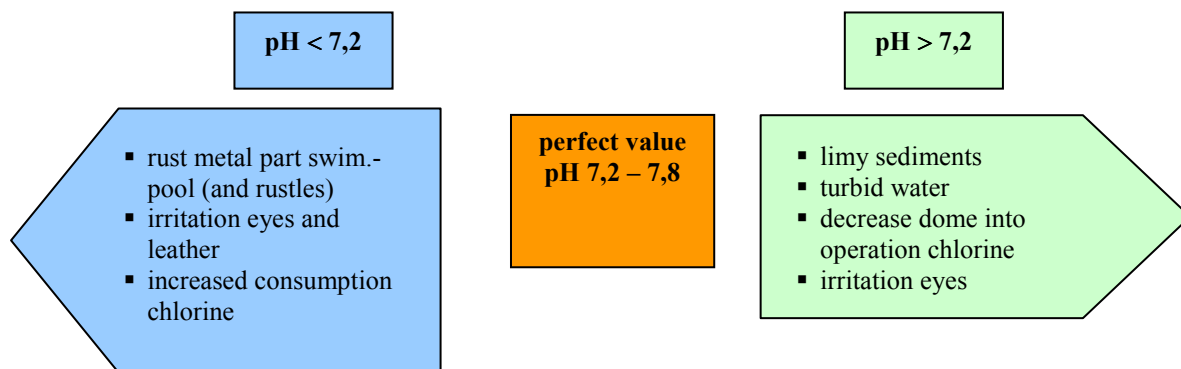
## PH FACTOR

PH factor waters in swimming - pool is measure evenness acids and basics (pH is at the same time in reality logarithmic measure free hydrogen ions). Neutral water has pH 7,0, acid water has lower pH and alkalic (alkaline) water higher pH.

PH factor fit for water in swimming - pool be between 7,2 – 7,8. This option lightly alkalic waters make it possible to production maximum quantity useful of free active chlorine and at the same time minimizes hazard incitement skin and eyes. PH factor in swimming - pool no stays constant, but is effected unyielding materials melted in water that the rise from added chlorine, from exploitation swimming - pool, and so on

A t values pH below 7,2 rises post danger rust metal materials, namely and rustless steels!!! Makes also bleaching process and creeping back plastic sheeting and in addition forms chlorine compound and nitrogen (mono - chloramine), which implicate incitement eyes and mucous membrane.

At values pH above 7,8 is aggravated possibility incidence chlorine at disinfection, rise sediment lime, thereby happens to pacification waters. Too high pH factor faces also to unpleasant attendant phenomenon at bathing, e.g. . Chlorination bad smell irritation skin and eyes as well as to plugging filters.

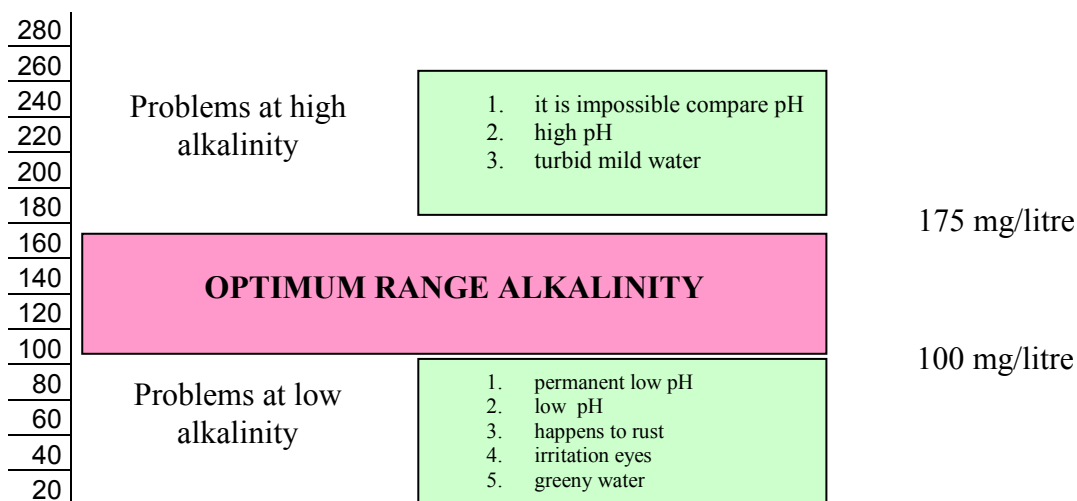


Problems with imbalance (SI) incurred:

- low pH – waste chlorine, creeping back PVC sheeting, incitement eyes and leather
- high pH – ineffectiveness chlorine, incitement eyes and leather

## TOTAL ALKALINITY

Total alkalinity is given content alkaline materials included in water and their form depend upon pH. Correct divide general alkalinity is 100 – 175 mg/litre, which makes it possible to carry on pH swimming-pool reactor waters without using chemicals.

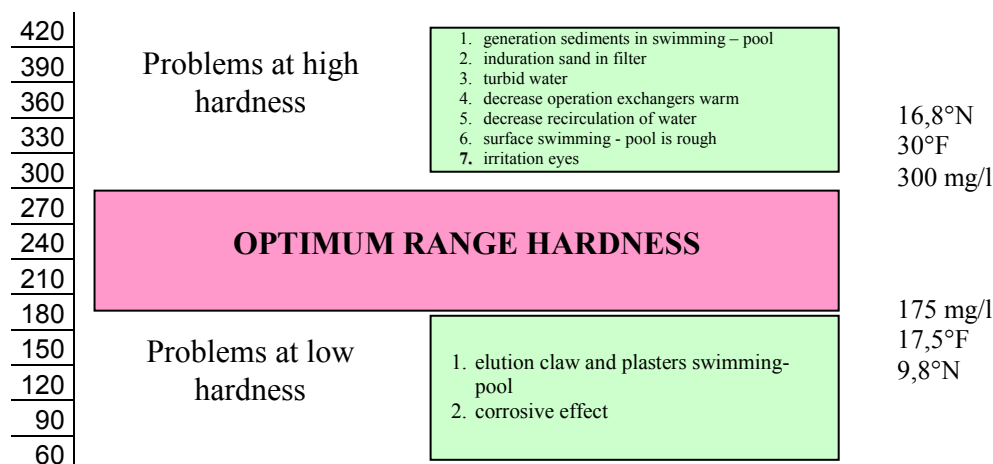


Problems with imbalance (SI) incurred:

- low alkalinity – vacillation pH
- high alkalinity – pH increases

### TOTAL HARDNESS

General water hardness is given largely content ions, calcium and bristly ox-tongue. Next elements like e.g. manganese or iron have - not on water hardness virtually no influence. Total hardness swimming-pool reactor waters has inch at intervals 175 – 300 mg/litre.



TDS is gross content soluble materials in water. Near drinkable waters inches at intervals 200 – 600 mg/litre, near salt waters 3 000 – 5 000 mg/litre and near sea waters is c. 35 000 mg/litre. Value TDS swimming-pool reactor waters would had be c. 2 000 mg/litre. Near swimming - pool equipped salt period drive instructions producer.

According to character soluble materials it is possible reduce to their content in water extension time filtration, frequent washing of filter and water renewal with low TDS.



## BALANCE WATERS (saturation index – SI)

Balance waters are very important, because well - balanced water is inoffensive, affected style scale and is totally limp. To hamper general fall waters into a state, when happens to production scale or to rise corroding conditions get past carry on break - even water mark.

Stop everything after figure:  $SI = (pH + TF + CF + AF) - \text{council. TDS}$

ALKALINITY		HARDNESS		TEMPERATURE		TDS	
mg/l CaCO <sub>3</sub>	AF	mg/l CaCO <sub>3</sub>	CF	°C	TF	ppm	konst.
<b>0</b>	0,1	<b>0</b>	0,5	<b>15</b>	0,4	0-500	12,1
<b>40</b>	1,6	<b>100</b>	1,6	<b>19</b>	0,5	1500	12,2
<b>80</b>	1,9	<b>150</b>	1,8	<b>24</b>	0,6	3000	12,3
<b>120</b>	2,1	<b>250</b>	2,0	<b>29</b>	0,7	5000	12,5
<b>180</b>	2,2	<b>500</b>	2,3	<b>34</b>	0,8		
<b>240</b>	2,4	<b>1000</b>	2,5	<b>40</b>	0,9		

Is if  $SI = 0$ , then is water in steady state.

Is if  $SI > 0$ , then has water corroding character.

Is if  $SI < 0$ , then has water tendency to limy sediments.

Practically considers to be the satisfactory  $SI = \pm 0,3 - \pm 0,5$ .

## FLOCKING (FLOCCULATION)

Flocking is possible bring sediments, afloat matters and also from parts melted matters included in water swimming - pools on filterable form.

Cataract waters in swimming - pool they may originate from different causes. For example creates insoluble microscopic seeding carbonate limy that elusiveness no accessible filter. Hardly filterable are and change element oils and albumins. Sources are suntan oils, sebaceous humor from perspiration bodies, make - up, but also oil from sheen. On sedated surface swimming - pool lodge like fat, but flounce bather passage through pumps easily disperse to the fine cataracts. Next cataracts are totaled colloidal scattered clay, colorants or organic adducts.

To optimum flocking it is necessary set pH on 7,8.

Overdosage flocculants agent will recognize after grey as far as blue troubled veil.



## STABILIZER (cyanuric acid)

This adduct extend to service life of free chlorine that protect from degradation ultraviolet component solar shine. At starvation wages or zero acidity cyanuric acid from swimming - pool at once disappears. Checks and edits cyanuric acid. Ideal range 50 – 100 ppm.

## TESTERS OF WATERS

To testing waters and valuation pH, chlorine et al. values get past use some of the tester waters. To assessment pH values and residual chlorine serves **DUO – test**.

1. **Aquacheck Yelow** – testing strips 4 in 1 – measures free chlorine, pH, general sourness, stabilisator
2. **Aquacheck Select** – test bed 5 in 1 – measures water hardness, general chlorine, free chlorine, pH and general sourness
3. **Aquacheck PRO** – testing strips 5 in 1 – measures general chlorine, general bromine, free chlorine, pH and general sourness
4. **Aquacheck 7 (Silver)** – test set 7 in 1 – measures hardness, general chlorine, free chlorine, pH, general sourness and cyanuric acid
5. **Aquacheck Iron** – testing strips – measures content steels in water
6. **Aquacheck TDS** – tester on metering melted unyielding elements in water
7. **Aquacheck White (salt)** – testing strip chloride soda lye (salts) – for easy and fast inquest content salts in water

If you need find out only appreciate pH or only appreciate salts, hereto are intended electronic tester:

1. **electronic tester pH** (values on display)
2. **electronic tester salts** (values on display)

After examination tester Attack carry out adjustment waters and do check analysis.

At the conclusion those chapter – so theoretic parts – we explain you what is stainless steel, what it has feature and characteristics. What happens at change pH or influence to environment etc.

## STAINLESS STEEL

Stainless steel is generic title for all type of steel that exempt from a system rust, or in other words you type of steel that are stamina of oxidation.

Steel is sturdy oxidation thanks features that are given admixture element as are: chromium, nickel and molybdenum. To swimming-pools employs austenitic steel and has like basic admixture 18 % chrome and 8 – 18 % nickel. Use labeling AISI 304 and when ingredient of molybdenum is, we speak about AISI 316.

Austenitic steel is sturdy than common carbide steel. Nevertheless, are here limits immunity that is necessary look.



Characteristics austenitic steels:

- **aren't magnetic** – have - not magnetic attraction, but can be in part magnetized
- **have good tensile properties**
- **no will make cloudy at heat adjustment** – it is possible is make cloudy only technique
- **sturdy in the face of rust** – easily cast over passive coat that creates their stamina against rust

**Stamina of stainless steel against rust is able to change or quite disappear.**

At steels is able to originate rust chemical or electrochemical corrosion that is incurred contact with unfavorable setting (liquid or fluent) and is able to quite damage material.

Causes that may cause rust:

### **1. SURFACE CHLORINE**

Stainless steel is sturdy definite concentration chlorine. At concentration superior to 2 mg/litre already is able to rust happen – therefore isn't fit dose chemicals over skimmer.

### **2. CONCENTRATION MELTED SALTS**

Solution of salt that is sedimentary at the surface of rustless steels, averting access oxygen upon this surface and at the same time averting production passive strata and her activation. Electrolysis salts (NaCl) makes nonreversible damage of all rustless materials in swimming-pool!!!

### **3. CHANGE pH**

If swing from ideal value pH (7,2 – 7,8), above all dispraise pH, makes aggressiveness waters and rise super fast rust rustless materials.

### **4. COMBINATION CHLORINE A DAMPNESS ENVIRONMENT**

Most frequent used to be combination of two factors so devaporation waters and chlorine.

### **5. CONNECTION OR CONTACT DIFFERENT MATERIALS**

When two or more kinds metal in water are, is able to get to galvanic rust at rise electrical network.

**Practical counsel for correct upkeep rustless steels:**

1. If rustless elements no embody no surface changes, is good is take out, wash clean water, dry and carry out preservation on time, when will not to be used.
2. If are perceptible indicia limy of sediments or oxidation, is necessary to clean cleaner stainless steel, wash tepid water, dry and preservation of preparation on preservation and polishing metals.
3. Removable elements mustn't it warehouse in proximity chlorine of arrangement or in store, where there are warehouse chlorine and other chemicals.
4. Removable elements must be warehouse on visible place, so that in the event of inquest marks surface oxidation could immediately carry out treatment according to point 2.
5. At prosecution it is necessary see at it, to swimming-pool reactor water always be clean.



6. Is prerequisite, to water had correct pH (7,2 – 7,8) and correct concentration of free chlorine (max. 1 mg/litre).
7. If is compile - time hand dosage or chemical shock (super chlorination), mustn't it dose concentrated chemicals get to rustless product (e.g. stairs, heat exchanger, electric heating, etc.). As well it is necessary avoid stain rustless product of what-wheels chemicals.
8. Bucklers rustless produce before salts, dust and impurities.
9. At cleaning swimming-pool, before his filling water or at services is necessary taking out from swimming-pool all rustless elements that is possible. Elements that is not possible take out, must be purified sufficient water quantity to on them no get stuck no cleansing preparation.
10. Restrain contact with by other metals, above all iron.
11. The more carry on rustless produce in cleanness, less care have you got with rust.

## PRACTICALLY

### POSITION 6 WAY VALVE



- **FILTR:** water from swimming-pool goes through filtration filling from agreement down and purge returns back to the swimming-pool by inlets
- **WASTE:** swimming-pool shed by the help of pump, using also at vacuum strong impure of bottom, water suck from except swimming-pool or to the drainage
- **CLOSE:** enclosure filtration
- **BACKWASH:** using at pollution sand, water goes through from below up filtration filling and junk passes away except swimming-pool after position „BACKWASH" have to follow position „RINSE"
- **RECIRCULATION:** water from swimming-pool only circulates (except filter), employs e.g. at mixture chemistry
- **RINSE:** used ALWAYS!!! after position „BACKWASH", water goes through filtration filling from down from top, lodges sand and flow out except swimming-pool (waste).

**!!!NOTICE!!!** At every manipulation with 6 way valve must be filtration period off. At nonperformance threatens damage to 6 way valve!!!

### PRESENTATION SWIMMING - POOL TO THE RUNNING

Before by every presentation swimming-pool to the running, e.g. after dormancy, long-term breakdown and before every new filling is necessary doing several basic acts.

Carefully we clean swimming-pool from lime sediments, soot, dust and organic the rests (careful clearing swimming-pool oversimplifies later care about water).

Before new filling we advise walling swimming-pool splash (smear 10 % solution algicidu) advise:

- **Attack Anti Algen** (gently foamy liquid preparation to liquidation cilia and their production)
- **Attack Anti Algen „S"** (gently foamy liquid preparation – super extract – increase in efficiency to liquidation eyelashes and their production)





- **Attack Anti Algen „SI"** (foamless liquid preparation – super extract – to liquidation eyelashes and against their production, that is of fit for rubbing mistakes and swimming - pools with countercurrent - wise)

Further check, whether are in switchboard all breakers in position **off**. All ball valves in position **closed** and screw up drain plug. After we can water let in of swimming-pool.

When we fill swimming-pool water, start to filtration arrangement:

- first coarse filter in skimeru clean
- hairy filter before pump clean
- check air-proofness pipeline and whether are wiring sadly constriction
- make sure, if is pump full waters
- ball valves (inlets, main drain, skimmer) we open
- termoregulator of heating put into position **off**
- 6 way valve to the position „CIRKULATION"



After it start control switch (protector) in switch - board (button TEST), check his functionality, protector have to thrust forth, again start and slowly button one breaker after second

**!!!NOTICE!!!** *In the event of, that the set startup whatever breaker this will thrust forth (will fall) or after wring buttons TEST protector incalculably, consult its dealer or directly specialty wiring firm and meanwhile let arrangement weaned.*

**!!** Least DISCONTINUE TROUBLE OURSELVES REMOVE!!!

Start filtration on manual (uninterrupted) running and check, whether pump expels strong flash, after it strain 6- the way valve to the position FILTRATION and again check, whether pump expels strong flash, eventually rinse sand in filtration (position valve WASH after it WASH and back on FILTRATION).

Earlier, than shall think of chemical treatment, leave in arrangement 24 hours into service and after we carry out general check see height.

When is arrangement in good order, carry out to the-cleaning swimming-pool. Strong junks remove swimming-pool net and sediments to bottom vacuum to the waste (vacuum see. further).

Then to the swimming-pool add preparation **Attack Stabilisator**.

**Attack Stabilisator** reduces consumption chlorine and stabilizes content of free chlorine thus averting his fast degradadation at higher temperatures or for strong insolation. Advise Stabilisator winding to right in skimeru, whereas is pump on the go. Stabilizer thaws slowly



and may become, that the in the early 12 – 24 hours will rise pressure in filter. Filter doesn't wash backward rinsing (WASH) nor him unclean along 24 hour.

On the instant at it carry out first chlorination. By get off microbiology germs and from freshly impregnate waters will exclude organic junks.

To first chlorination is ideal use granulated or quickly soluble chlorine, advise:

- **Attack Chlor Chock** (soluble, superchlorination granulate to demolition eyelashes and micro - organisms – nobody's most common kinds eyelashes and chides and be effective and against bacteria and virus)
- **Attack Chlor 20 g** (quickly soluble tablet 70 % content chlorine to fast on chlorination swimming-pool waters – destroy most kinds cilia and fungi, effective against bacteria, virus and other micro-organisms)

**!!!IMPORTANT!!!** *All preparation (except liquid) has to in due form stir up, to undamaged walling or bottom swimming - pool.*

Appreciate chlorine and pH check by the help of tester pH and Cl, near of others preparations adhere instruction on dosage.

In the early gout after first chlorination untidy appreciate pH. However at the latest to a man week compare pH waters to the her ideal range (7,2 – 7,8).

After adjustment funds pH add to the waters as a precaution preparation against eyelashes:

- **Attack anti Algen**
- **Attack anti Algen „ S"**
- **Attack anti Algen „ SI"**

After it, when we're performed adjustment pH waters, we can put the heating on. Check, whether in switch - board is breaker and switches heating in position up and order oven on requisite temperature.

After first week uninterrupted running filtration arrangement, we can strain operating from manual on automatic recall (check, eventually adjust switching rate o'clock so, to swimming-pool reactor water in swimming - pool interchanged 2 as far as 2,5 x behind 24 o'clock).

## **RUNNING ATTENDANCE SWIMMING - POOL**

Along bath season *check* testing suit water quality what most often, at least however:

<b>A week</b>		<b>monthly</b>	
pH:	7,2 – 7,8	Calcic hardness:	250 – 500 ppm
free Cl:	1 ppm	Total alkalinity:	80 – 120 ppm
		Cyanuric acid:	50 – 100 ppm
		Saturation index:	± 0,3 – 0,5

First check appreciate pH (pH factor among 7,2 – 7,8).

pH factor is:

- **lower to 7,2** ⇒ tack preparation on write - up pH
  - **Attack pH plus**



- **higher to 7,8** ⇒ tack preparation on decrease in value pH

- **Attack pH minus**

Like next check value of free chlorine – **value chlorine (Cl) 1,0 is ideal.**

Value Cl is:

- **lower to 1,0** – complete content Cl. To the dosing machine Cl give slowly soluble chlorine
  - **Attack Chlor 200 g**
- **lower to 0,5** – like see height and in addition use to fast completion and quickly soluble chlorination preparation
  - **Attack chlorine Chock**
  - **Attack Chlor 20 g**
- **higher to 2,0** – drop part waters and complete water green or abide as far as value Cl sags on 2,0

In the event of, that it is not possible wait, as far as value of free chlorine sags, use on neutralization chlorine preparation:

- **Attack chlorine Chock**

**!!!At values Cl above 2,0 bathing DISSUADE!!!**

Need chlorine will change depending on air temperature, waters, of the number of bather, frequency and intensity rains and storms.

On interface between swimming-pool reactor water and afloat lodges scale, oil, dust and other junk from surroundings swimming - pool. These sediments be not only unaesthetic, but are also nutritive soil for growth eyelashes and bacteria. Therefore minimally 1x a week formed „line" clean – **Attack Detergent.**

**On cleaning lines don't use common preparation, because would we're could depreciate water quality as well as damage walling swimming-pool!**

If is over correct values pH and Cl evident cataract (slight soaring seeding) is water demand in swimming-pool flocculate:

- **Attack Flocculant**
- **Attack Flocculant „ C"** – high - performance cartouche with flocculant of preparation for sand filters. Improve filtration effect, simple and light handling – cartouche put in to the skimmer.

**!!!Minimally 1x a week (in case of need more often) advise check and clearing hairy filter before pump and backward flush (clearing) filtration!!!**

All-season, disinfection, microbial and against growth preparation for operation swimming-pool to will provide us „**Attack Quattro**". It is effective against cilia, fungi and virus. It makes possible to safe and comfortable maintenance chlorine that water disinfection and oxidate organic junks.

**!!!NOTICE!!! It isn't acceptable for the first chlorination and shock chlorination.**



Novelty in the market is mineral dosing machine „Instant FROG", which is mineral enclosure to the massage spas and swimming-pools. Warrants natural water purification, thereby increases water quality at cost reduction on servicing.

## BACKWARD FLUSH

Switch off filtration, swipe on 6 ways valve put into position „WASH" and start filtration. When from filtration flow out pure water (verification trailing glass) cut off filtration. Swipe of valve put into position „ WASHING" and start filtration.

Wait until begins flow out pure water and switch off filtration. Swipe put into position „FILTRATION" and start filtration. By is wash sand completed.

## CLEARING HAIRY FILTER

Switch off filtration, close all valve, swipe 6 ways valve put into position „CLOSED". Unscrew cover hairy filter; take out net and totally clean. Return net on original place, draw close cover hairy filter, swipe 6 way valve put into position „ FILTRATION", open all valve.



May become (e.g. when forget dosing Cl, pH, after long-term rain, at extremely high water temperature and air etc.), that reach to multiplication cilia. At the moment when cilia are visible, grow up them million in every litre waters. Cilia may colour green, brown, black and yellowish. Bottom and sides of swimming-pool are greasy and water is sticky. In that first phase multiplication of cilia is necessary measure value pH and chemical of preparation introduce into advised range. After it carry out single (emergency) chlorination, so-called „CHOCK", it means that with the help of quickly soluble chlorine (Attack Chlor Chock, Attack Chlor 20 g) water in swimming-pool fitfully superchlorination (free chlorine – value 3 Cl) and at the same time add to the swimming-pool dose preparation against cilia:

- **Attack anti Algen**
- **Attack anti Algen „ S"**
- **Attack anti Algen „ SI"**

Advise dose 2 – 3x higher than basic dose.

In a few hours (at running filtration arrangement) is water again clean. It is necessary pressure of steam gauge on filtration arrangement and filtration regularly wash to capture cilia washed away to waste in filter. When it is necessary, water yet flocculate:

- **Attack Flocculant**



- **Attack Flocculant „C"**

Clean bottom and walling brush.

Not even at oversight first phase – attack to cilia isn't necessary water empty from swimming-pool, even if is already considerably coloured. Again first adjust pH to the correct range (7,2 – 7,8) and along two days carry out several times „shock" chlorination. Cilia formed out at bottom carefully vacuum.

**!!!Not forget that regularly wash filtration arrangement!!!**

After such treatment water is bathing indeed possible to only, as far as metering will show admissible content chlorine.

## **STRIPPING ROUGH IMPURITIES**

In term of manipulation with them we can divide to two groups:

1. To the first group belongs to **junk decreasing to bottom** – sand, grit, rotten leaves, and biological remnants. It may be accidentally downfallen or on purpose throwing - in subjects. In chlorine's water about iron articles creates heavy removable brown soil. Sharp subjects are again dangerous how for swimming-pool liner, so for bather. These junks remove defundation or exhaustion (vacuum).
2. To the second group belongs to **junks** that the either **swim on surface** or **uplift** such as for example insect, air-borne seeds, foliage, grass - blade, hair etc.

All organic junks are nutritive soil for micro-organisms. Every day remove uplift junks by the help of nets. Also every day clean first filter coarse impurities placed in skimmer.

## **EXHAUSTION BOTTOM – VACUUM**

Almost near of each of filtration install oneself take into account access flooring vacuums. Near bigger swimming - pools count special road junction. To satisfactory function exhaustion from gout see next points:

- Hairy filter pump have to be clean!
- Filtration arrangement would have been layer!
- All other „sucking" conduit has been reserved, whereby achieve full output pumps on filter flask place (skimmer) for hose flooring vacuums!
- Hose flooring vacuums must be fill water!
- Filtration arrangement is up!

Performance hose flooring vacuums:

- Build flooring cleaner with outspread hose to the waters and insertion hose slowly to the waters. By hose filling - up from below and air coming-out on opposite end hose.

***!!!NOTICE!!! This progress functions only at that time, when is hose before beginning performance empty, because without consequence is able to air start from hose. After it hose add directly or over skim-vac to the sucker skimmer.***

## User manual of swimming-pool



At small pollution we can vacuum with swipe 6 way valve on „ FILTRATION", then indeed we may not forget rinse filtration arrangement.

At strong pollution vacuum bottom with swipe 6 way valve in position „DRAINAGE".

***!!!NOTICE!!! After vacuum and launder sand don't forget that turn on a valve, complete swimming - pool water and clean hairy filter!***



## POSSIBLE PROBLEMS A THEIR ABLATION

Also near best trim swimming - pools they may originate problems with servicing of waters:

PROBLEM	CAUSE	SOLVING
<b>Irritation eyes, skin, and bad smell of chlorine</b>	overly high or low pH, present chloramine causing of organic waste combine with free chlorine disappear	measure and adjust pH, chock chlorine eliminate combine CL and change him to free Cl
<b>Rate residual free chlorine is very fast lowers</b>	often using of swimming-pool – stormy weather (high temperature of air)	chock chlorine, fill in stabilizer
<b>Lime sediments</b>	pH is overly high, calcium of hardness is overly high	measure pH and adjust (Attack pH minus)
<b>Rust metal of parts</b>	overly low pH	measure pH and adjust (Attack pH plus)
<b>Cataract or milk water</b>	insufficient flow filtration, total quantity fixed decay is overly high, pH is overly high, much decay of organic	check of filtration, make backward scouring, dosing flocculant (Attack Flocculant) for speeding process, empty 1/3 to 1/2 water in swimming-pool and replace fresh water, chock chlorine, change sand, if old at least 1 year
<b>Green and turbid water and greasy sides</b>	present cilia	measure pH a adjust, if necessary, using Attack Anti Algen (S-SI), further chock chlorine. If necessary repeat chock chlorine to 24 hour. Filter start consecutively, regularly elute if water is always turbid, study paragraph about cataract and milk water
<b>Clear but coloured water (black, brown, green or pink)</b>	metallic impurity as copper, iron, manganese are oxidizable in water	measure pH and adjust on 7,8, treat water to flocculant, return pH to ideal area (7,2-7,8) – chock chlorine, using preparation against iron, repeat treatment if necessary
<b>Frothing face</b>	overly concentration to alginate	partly empty and a dilute fresh water until water don't stop froth, lower dosing alginate or using Attack Anti Algen „SI“
<b>Soil black and panniform</b>	present black cilia climbing up to bottom and walls	black cilia are very resistant!!! check pH and adjust, use Anti Algen – at 24 hours chock chlorine – repeat chock chlorine every 24 hours – clean disaster area by brush, if black soils are visible after 3 – 4 days attendance - lower surface of water so that you may brush soils 15 % solution – you don't forget that chlorine may colour (burn) to liner
<b>Heating don't heat</b>	bed flow of water	clean skimmer, hair filter and wash sand in filtration

Dosage all chemicals divided to best half and effectivity to make certain by tester. It best better lending to chemicals to the swimming-pool in two parts than all of and it overdosage. **For extremely high temperatures in summer, advise extend time filtration. Chlorine preparations dose best after sunset.**



## ATTENDANCE WATERS AT THE TIME HOLIDAYS

If want to after return from holidays again use swimming - pool without of what so that him had to clean and newly fill, we have to swimming - pool before departure get:

- clean hairy filter and rinse filtration arrangement
- clean filter from coarse impurities in skimmer and clean „ line"
- swimming-pool vacuum and complete water at the most 2 cm below top margin skimmer
- adjust appreciate pH (7,2 – 7,8)
- to the dosing machine chlorine give threefold quantity slowly soluble chlorine
  - **Attack Chlor 200 g**
- to the waters add preparation against eyelashes
  - **Attack anti Algen „ S"**
  - **Attack Anti Algen „ SI"**
- ensure, to filtration arrangement button every day, at least on 10 o'clock
- after return from holidays check and adjust funds pH and Cl
- swimming - pool vacuum - clean and clean „ line"
- clean skimmer and hairy filter
- carry out backward washing of filter

## SERVICE INSTRUCTIONS PUMP

- Ensure to pump wouldn't be in damp environment!
- Enforce to pump always be well draught!
- Will never any hide motor pump!
- Regularly check and clean hairy filter pump (minimally 1 week)!
- Before winter empty water from pump and hairy filter. Treat sealing o-ring by silicon rubber oil!

## WINTERIZE SWIMMING - POOL

Before winterize of swimming-pool we have to do several acts. Careful preparation for winter to us will make easy initiation swimming - pool before new bath season:

- carefully clean swimming - pool
- adjust value pH and Cl
- to the waters give winterize agent – **Attack Winter**
- carry out backward wash
- drop swimming- pool 10 centimeters below skimmer (we can by the help of backward wash)
- screwed stopgaps to the nozzles and draw - tube to the skimmer
- to the swimming - pool give floats (near oval longwise, near rectangle on diagonal)
- close all valve inclusive 6 way valve
- let out water of all arrangement in machine - room (pump, filtration, chlorine instrument, heating)
- in chlorine wouldn't stay on no chlorine
- if is necessary change sand, take out him now
- clean hairy filter
- rubber o-ring treat by silicon rubber oil





- cut off current supply (all breaker to the position off)
- treat rustless lots
- swimming-pool cover winter sheet

At start swimming-pool in spring we proceed according to chapter „Presentation swimming - pool to the running”.

A lot of care and time with adjustment and upkeep waters will save for a certainty automatics metering and dosage pH and Cl – Autodos (automatics on adjustment waters).

## SERVICE TO INSTRUCTIONS OF HEATING

Heating is possible use only on arrangements in swimming-pools and massage spas, whose flow of water is min. 6 m<sup>3</sup>/hour.

***!!!NOTICE!!! Assembly heating and putting to operation is able to do only specialist!!!***

***Heater control:*** on heating (CD player) be placed oven. Veer oven after direction hourly fingers increases temperature, anticlockwise decreases temperature until outage heating. Near heating super C can be oven set and except heating. Like orientation datum about adjusted temperature can be used issue on oven against dart.

***!!!IMPORTANT!!! At breakdown from running have to heating cut off! (Use drain plug that is placed in bottoms heating). Treat flush drinkable water.***

***!!!NOTICE!!! Overly lower pH and strong concentration chlorine is able to heating very quickly and permanent damage!!!***

## DIRECTIONS FOR ATTENDANCE ELECTRIC, FILTRATION A HEATING ARRANGEMENT SWIMMING - POOL

### **!!!IMPORTANT NOTICE!!!**

Whole arrangement is protected by jet protector that serves at the same as main switch. Jet protector is element for increasing security surface of security persons before dangerous touch voltage. On own jet protector may not be made no servicing. Get on only prove top condition turbojet protector pressing trial buttons. Protector must always cut off. This revision has carry out at least once monthly. If at pressing trial buttons protector don't cut off, as are attendant all the phase tension (after effected verification specialist), is protector defective and must to replace other protector, which he may carry out only competent specialist. If protector will cut off, neither was pressed trial button, then it is necessary find out cause outage. If jet protector again set startup break step, it is necessary leave in arrangement disconnected and competent specialist let repair disorder that incurred outage turbojet protector.

***To the electric arrangement mustn't it encroach, nor him correct person or organization without appropriate electro technical qualification!!! Arrangement is sealed and for a period of guarantee may not be break. Otherwise dissolve in title to free of charge correction.***



Putting in operation off or weaned electric arrangement:

- verification setting oven warming - up
- verification button - down state breakers
- control switch – protector to the position – up
- functional test protector button „ TEST", protector have to thrust forth
- again make off protector
- verification and setting timer regime filtration
- power switched on filtration
- elect regime filtration by hand (always) or automatically (controlled timer)
- power switched on heating (running be geared oven and activity locked filtration)
- verification activities lighting (off lighting to the position – up)



## UV LIGHT, SALT PERIOD, AUTOMATIC PROPORTIONING pH and Cl

Unless you have from any reason time for ever check appreciate pH or chlorine as well as nevertheless do you want achieve clean waters in your swimming - pool, you can use UV light, salt period (Attack Pool pilot) or automatic proportioning pH and Cl.

### UV LIGHT

**UV LIGHT** is arrangement that the plying principle UV radiation. Barbules direct on flowing water. This process happens to disinfection and demolition bacteria.



Benefits treatment waters UV light:

- water is energetically and safely disinfects
- prevent rise chlorinated smell, eventually irritation of skin and eyes
- not rise no adjacent chemical allied substances

UV lamp is excellent as supplement chemical semi-automatic machine, where we can reduce to chemical dosing on minimum, namely as far as about 80 %. Using UV lamps espressivo will reduce to costs on servicing to swimming - pool.

If have you got swimming - pool with high content calcium, is good install so-called **Magnet „AquaMag"**. This installs on pipeline and is molecular changing structure waters, whereby don't happen to exclude of calcium.

### SALT PERIOD

#### ATTACK POOL PILOT

Using electronic of the process happens to electrolysis and disinfection swimming-pool waters. Control section quite changes salt on 100 % clean sodium hypochlorite that destroy bacteria and viruses. This process hasn't influence on change pH, general sourness, TDS and present cyanuric acid, which oversimplifies servicing your swimming - pool.

Disinfection swimming-pool reactor waters proceeds fully automatic (if well will set) and does not require later hit.

Attack Pool Pilot already handle minimum salts 2,5/l (2 500 ppm), which is stainless value, at which it is possible use standard practice and equipment swimming - pool, but also with value 35 g/l (35 000 ppm), which is brinness sea waters.

Offer:

- **Attack Pool pilot software Touch**
- **Attack Pool pilot Digital**



Ability operate with low value salts expressive lowers sedimentation crystals of salts on sides swimming - pool and minimizes title to swimming-pool equipment.

## **AUTOMATIC PROPORTIONING**

For automatic measurement and dosage pH and Cl in swimming - pools and massage spas we can use automatics – **Autodos**.

**Autodos 2000 pH/Redox** is full arrangement that the measures pH+ Redox and dosage pH + Cl.

**Autodos 4000** is automatics for measurement and dosage pH, Cl and measurement and regulation temperature in swimming - pools and massage spas. Measures are by the help of pH, Redox and free chlorine. Doses are pH- and/or pH+, chlorine.

If you want to combine automatics with computer, to that you will serve **Autoleger**. That will enable join Autodos 2000 and Autodos 4000 with your computer. All communication is able to do by the help of PC. Then regulation, printing exits values etc.



## User manual of swimming-pool



Now, after read those manuals already you know, how look after to the best about its swimming - pool. You know, what would you have had use behind chemicals, if you e.g. will turn green water, what care etc.

Hope, that the now you will have its swimming - pool glassclear and as though will you take on only pleasures from waters with his family or friends.

If however will you be a problem, with which won't you know advise with problem, call to us, like to you help.

Yours truly team workers

