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Thomsontec

350 MPC Ion System

ThomsonTec ion systems were designed to assist in controlling bacteria and algae in pools. This device will augment bactericidal and algicidal activity of primary disinfectants such as chlorine or bromine in swimming pools. A minimum of 0.6 ppm free available chlorine or the equivalent bromine residual must be maintained. Regulated pools must follow provincial or municipal guidelines. Warning - Copper levels over 0.5 and a pH reading over 7.8 may cause copper to precipitate.

READ THE LABEL AND GUIDE BEFORE USING

DOMESTIC

KEEP OUT OF REACH OF CHILDREN

REG. NO. 26597 PCP ACT

ThomsonTec

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350 MPC Ion System

REG. NO. 26597 P.C.P. ACT

DOMESTIC

KEEP OUT OF REACH OF CHILDREN

350MPC Installation and Operating Instructions

IMPORTANT SAFETY INSTRUCTIONS

When installing and using this electrical equipment, basic safety precautions should always be followed including the following.

READ LABEL AND GUIDE BEFORE USING. FOLLOW ALL INSTRUCTIONS.

WARNING - to reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.

WARNING - Risk of electric shock. Connect only to a 110 VAC grounding type receptacle protected by a ground fault circuit interrupter(GFCI).Contact a qualified electrician for installation or if you cannot verify that the receptacle to be used is protected by a GFCI.

WARNING - Do not bury cord. Locate system and cord to minimize abuse from lawnmowers, trimmers and other equipment.

WARNING - To reduce risk of shock, replaced damaged cord immediately.

WARNING - To reduce the risk of electric shock, do not use with extension cords. Connect only to a properly installed and located electrical outlet.

WARNING - Do not sprinkle granular chlorine into the water. It can settle on the bottom undissolved and may cause black stains.

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Save these instructions. Refer problems to qualified personnel. Do not attempt to dismantle or repair. No user serviceable parts. Warranty void if tampered with.

350MPC Installation and Operating Instructions

Installation:

Installation of the 350MPC includes the plumbing of the flow cell into the recirculating system of the pool and the connection of the controller to the electrodes mounted in the flow cell. The standard flow cell provided with the 350MPC is a 2" PVC - T. It is plumbed in line in the recirculating (not the booster pump line) system using standard PVC primer and glue.

A suitable position for the flow cell is in the recirculating line where there is room to cut out a 6 cm (2 1/4") section and install the flow cell. Ensure there is also access to unscrew the electrodes for periodic inspection or replacement. Optimum positioning would be on the return line right after the filter.

The electrode cap will be screwed into the threaded portion of the flow cell. Use about 5 wraps of teflon tape around the threads on the flow cell cap and screw into the flow cell until snug. This can be done before or after the flow cell has been installed, whichever is more convenient.

Step by Step Flow Cell Installation:

1. Cut a 6cm. (2 1/4") section out of the return line of the recirculating system.
2. Smooth the cut ends with a file or sandpaper.
3. Apply PVC primer to both these cut ends (approximately 2.5cm or (1”))and the inside ends of the flow cell.
4. Apply a liberal coating of PVC glue to all primed sections and quickly insert the flow cell into the correct position pushing the pipe into the flow cell until it seats.
5. Hold for approximately 30 seconds or until set.
6. Install electrodes in flow cell if not done previously.

The installation of the flow cell is now complete.

Check for leaks.

Controller Installation:

1. Mount the controller in a convenient, dry, sheltered position close to the pool and to an electrical source.
2. Attach the two leads with the "U" clips to the power transformer. Attach the two pin leads to the flow cell by releasing the small slotted screws on the electrode cap, inserting the pins in the holes, and tightening the screws until snug. It is very important that the leads with the "U" terminals be connected to the transformer and the others to the flow cell to avoid damaging the controller. After all connections are made, plug in the transformer into the AC outlet.

Operation:

The following outlines the procedure for the setting and operation of the control panel of the 350MPC.

The lights and functions on the control panel are as follows. "FWD" is the operation of the forward cycle of the ionization process. Current direction is from anode(+) to cathode(-) . The indicator is on when this is functioning.

"REV" is the reverse cycle of the ionization process. Current direction is from cathode(-) to anode(+) . The indicator is on when this is functioning

"ANODE" indicates there is current flowing from one electrode to another. The indicator is on when this is functioning.

"SET/RESET" is used to start the ionization process or allow the operator to change the duty cycle.

"SET DUTY CYCLE" increases or decreases the numbers in the digital readout.

The "DUTY CYCLE" display gives a visual reading from 1 to 99. This indicates the percentage of time the system is actually sending power to the electrodes. A more detailed description of the operation follows.

Step by Step Operation:

When the transformer is plugged into the AC power, the digital readout on the control panel will activate. To activate the system or change the settings follow the instructions below.

1. Press the "Set/Reset" button. The digital readout will start to flash.
2. Press the "Set Duty Cycle" button and the numbers on the readout will increase in single digits each time the button is pressed. If you continue to hold the button down, the readout will advance for as long as the button is held and will cycle through the range from 1 to 99 continually. Cycle through to reach the chosen number.
3. Press the "Set/Reset" button again. This will activate the system on the desired setting. The display will

stop flashing, and show the selected setting.

By adjusting the time the current is sent to the electrodes, you adjust the amount of copper dispensed into the water. A test kit is provided to measure the copper content of the water. Follow the instructions on the test kit to determine the level. The recommended range is between 0.25 and 0.4 parts per million(PPM). If the level is high, turn the system down by lowering the number on the readout, if it is low increase the number. Test the copper level every day initially. When it reaches an acceptable range and remains stable, take note of the setting. Whenever you change your water you can return it to this setting.

It is recommended that you test the water on a weekly basis to insure a proper copper level. If the level is not within range adjust the controller accordingly.

Here is a more detailed description of the operation of the 350MPC.
The controller on the 350MPC supplies power to the electrodes (the anode and cathode) . The output from the controller is preset and non variable. To adjust the amount of copper dispensed from the electrodes, you adjust the timing of the duty cycle. A duty cycle is simply the time it takes for the controller to complete a timed sequence of functions. Or, the time it takes the system to go through one complete operation. So rather than varying the power to the electrodes to adjust the ion output, the amount of time that power is applied to the electrodes is adjusted. A full duty cycle of the 350MPC is approximately three minutes. This would include a "FWD" stage, a "REV" stage and an off stage to complete a full duty cycle.

When changing the number on the digital readout with the set/reset and duty cycle buttons, you are changing the amount of time that power is being sent to the electrodes. It may be easier to think of the number displayed as a percentage. As an example, if the system were set to 50, this would mean the system is "on" and charging the electrodes 50% of the time and off 50% of the time.

So what would you see on the control panel? The Duty Cycle 50% accompanying graph will help to illustrate. The duty cycle consists of four stages; forward, off, reverse and off. In the first stage, the "FWD" indicator is on. The anode indicator is also on. The anode indicator should be lit throughout the full duty cycle. After about 45 seconds the controller will change to the "off' position. Only the anode indicator would be lit. After another 45 seconds, the "REV" indicator would be on along with the anode indicator. Next the system, would move to the off position for the remaining 45 seconds of the full duty cycle. At the completion of this time in the off position, the full duty cycle is complete and the process starts again. As a result the system is on 50% of the time (25% FWD and 25% REV) and off 50% of the time. Set to 40 on the panel and the system is on 40% of the time and off 60%. and so on. At 99% the

system is on all the time except the time it takes to switch from forward to reverse. Set at 0, the 350MPC is off.

WATER BALANCE & MAINTENANCE

It is very important to maintain correct water balance and maintenance habits. Perform the required water tests as recommended and add an oxidizer as required.

The 350MPC ion system does not control or change the need for correct water balance. Consult with your local pool dealer. They will be able to provide you with proper instructions for your specific application. Failure to maintain correct water balance and oxidize as required can affect the performance of the ion system.

As the 350MPC ion system has no oxidizing potential, it is important to add an oxidizer to the pool once each week. This will help keep your water clear and sparkling, A non stabilized chlorine or any one of the commercially available non chlorine shocks can be used. If using a chlorine, dilute the required amount in water and pour into the pool. For a non chlorine oxidizer, follow the manufacturers directions for use.

Ozone is also a very effective oxidizer. Recommended levels for correct water balance

PH	7.2 to 7.4
Total Alkalinity	80 to 120 ppm
Calcium Hardness	200 to 300 ppm
Copper	0.25 to 0.4 ppm
Free Available Chlorine	0.6 ppm

CLEANING THE ELECTRODES

If the indicator on the control panel is not lighting or the performance of the unit deteriorates, check the condition of the electrodes. They may become coated with a calcium deposit. This is normal but means they require cleaning. To do this, unplug the unit. Then, disconnect the leads from the electrodes. Remove them from the flow cell. Stand the electrodes in about 5 cm or two inches of muriatic acid for a few minutes or until the coating is dissolved. Remove from the acid and place it in a solution of sodium bicarb to neutralize the acid. Rinse, reinstall in the system and set the controller as before.

It is very important to wear protective gloves, clothing and eye wear when working with any acids or caustic chemicals.

Supplement to Operation Manual

Water Balance And Trouble Shooting Guide

Proper pool maintenance, water balance and testing are an integral part of having and maintaining a clear, clean, sanitary pool.

Circulation & Filtration:

Proper circulation and filtration is necessary for clear water. Make sure your filter system is adequate and operating properly. Good circulation and adequate water turnover is important. Follow the recommendations of the manufacturer for pump and filter maintenance.

Water Testing

Test pH and Copper at least once a week. A full water test should be done monthly. Use one of the commercially available test kits or have your pool maintenance company do this for you.

Water Chemistry & Balance

Recommended Levels

pH	7.2 to 7.4
Total Alchalinity	80 to 120 ppm
Calcium Hardness	200 to 275 ppm for gunite, less than 350 for vinyl pools
TDS	300 to 1000 ppm
Copper	0.25 to 0.4 ppm
Chlorine	Free Available 0.6 ppm

Oxidize Regularly

The ionization process is extremely effective at preventing the growth of algae through the destruction of the organism's enzyme balance. However, the process is unable to address the removal of organic material, body oils, and suntan lotions. The presence of these materials can cause cloudiness in the water or an oily residue along the walls at the water line level. A treatment of potassium monopersulfate or a chlorine shock will remove the organic material from the water.

Develop an effective and timely maintenance schedule.

Take the time and develop a comfortable consistent regime for looking after your pool. Pool maintenance can be reduced by adopting some routine maintenance habits. Perform the required tests and water balancing procedures to maintain a healthy, clear swimming pool. Regular vacuuming, backwashing of sand filters and cleaning of the cartridge
filters is important. The skimmer and strainer basket should be checked for debris, and the water chemistry such as pH and ion level tested weekly. A good test kit will be a great help. Keep the scum line clean and inspect the deck equipment to ensure it is in good repair.

The key to water treatment is an understanding of how chemicals interact in the pool water, a constant play between demand and balance

The term "demand" is the need to add chemicals and/or disinfectants to the water. Balance means all chemicals that have been added to the water are working efficiently within recommended ranges. When the pH, total alkalinity, calcium hardness, and total dissolved solid concentrations are at the desired levels, the chemicals are working most efficiently and the pool is most easily and economically maintained. Sanitation is most easily effected when pool water is in balance.

PH CONTROL

pH is the term used to describe water being acidic or basic. It is measured on a scale from 0 to 14 with the acceptable level for pools being between 7.2 to 7.8.

The following scale provides a basic rule of when and how to adjust pH. Amounts required are given in a chart at the end.

6.8-7.2	7.2-7.4	7.4-8.0
acidic	acceptable	basic
add soda		add acid

Soda and acids may be purchased at any pool store. During the swimming season, pH should be monitored at least once a week. The pH should always be tested after rain storms or heavy bather loads. If the pool is covered, it is important to check pH as a covered pool is more susceptible to scaling. Maintaining a total alkalinity of 80 to 120 parts per million will help to stabilize the pH.

A new plaster pool will leach high pH into the water during the first few months of use and will usually require frequent pH adjustments before the plaster cures and finally settles down.

Muriatic acid, if applied incorrectly, can reduce the total alkalinity of your water. We suggest the use of dry or granule acid to reduce pH without changing the total alkalinity.

As PH climbs, free copper ions in the water will be reduced as they combine with other minerals to form precipitates. Additionally, water with high pH can cause scale building up on plaster walls and prohibit most chemicals from working. The ionization process will work in acidic water; however, if the pH falls below 7.0, the water will become corrosive. Acidic water can damage pool equipment, pipes, fixtures, stain pool plaster, irritate swimmer eyes and noses, and decrease the useful life of electrodes.

Total Alkalinity

Total alkalinity refers to the amount of hydroxides, bicarbonates, and carbonates (baking soda) present in the pool water. As mentioned above, keeping the total alkalinity at a level of 80 to 120 ppm will help keep a stable pH level of 7.2 to 7.4.

Calcium Hardness

Calcium water hardness refers to the amount of calcium carbonate and magnesium in solution. A high hardness level in combination with a high alkalinity can cause scaling on plaster and pool equipment. Hardness also effects the rate at which the system will ionize water. Hard water, at levels above 350 ppm will cause greater electrical conductivity and thus a faster rate of ionization. Opposite to "hard" water is "soft" water, or water in which there is a low level of calcium and magnesium. While the virtues of soft water are often desired in reference to washing one's hair or clothes, soft water is not desirable in swimming pools. In plaster pools, lack of calcium in the water may cause weakening and/or etching of the walls. In pools, the same conditions will cause a deterioration of the grouting between the tiles. In addition, soft water can be corrosive to pool fixtures.

WATER BALANCE

1. TOTAL ALKALINITY SHOULD BE BETWEEN 80 AND 120 PPM

100 ppm is optimum. Use the charts in the back of this manual for correct additives.

INCREASE total alkalinity by adding buffer or booster while the pump is running.

DECREASE the total alkalinity by adding liquid muriatic acid. Turn the pump OFF and add small amounts to numerous spots in the water. NOTE: If you adjust the total alkalinity, wait 24 hours before testing the pH.

2. THE pH SHOULD BE BETWEEN 7.2 AND 7.4

Adjust the pH to 7.2 - 7.4 using the charts in the back of this manual.

INCREASE the pH by adding commercial pH increaser or soda ash while the pump is running. DECREASE the pH by adding a

commercial pH decreaser or dry acid while the pump is running.

3. THE CALCIUM HARDNESS SHOULD BE WITHIN THE FOLLOWING RANGE

CONCRETE OF GUNITE POOLS 200-275 ppm VINYL LINER POOLS less than 350 ppm

Adjust the calcium hardness using the chart in the back of this manual.
INCREASE the calcium by using calcium
chlorite, or a calcium booster.

DECREASE the calcium by diluting the water. Consult a specialist before attempting this.

4. THE TOTAL DISSOLVED SOLIDS SHOULD BE LESS THAN 1800 PPM

DECREASE the total dissolved solids by diluting

the water. Consult a specialist before attempting this.

5) THE COPPER LEVEL SHOULD BE KEPT BETWEEN 0.3 PPM AND 0.5 PPM

INCREASE the copper content of the water by adjusting the controller to a higher setting.

DECREASE the copper by turning the system down. The control unit can be turned off if the copper level is over 0.5 ppm.

Free chlorine levels in excess of 1 ppm may interfere with the copper test kit. A chlorine neutralizer, or a low chlorine residual will be required to ensure the accuracy of the copper test.

As the pH rises, some of the free copper ions will combine and show a low copper reading. Verify the pH is below 7.4 for the most accurate copper test.

IF A PROBLEM ARISES Go back to basics. Check to see that your equipment is working correctly, the water is in balance and there is adequate sanitizer and algae control. If there is no immediate solution or you encounter problems you cannot solve, contact your pool, service professional. They have the knowledge and equipment to solve problems.

Here are a few specific problems and their solutions.

BATHERS GET BURNING EYES

It may be caused by:

a) High pH
b) High organic loading

REMEDY:

a) Lower the pH to between 7.2 and 7.4
b) Oxidation is required, Use oxy-brite or similar product or an unstabilized chlorine shock

CLOUDY WATER GREEN LOOKING WATER can be caused by:

a) Algae
b) Poor Filtration
c) Poor Circulation

REMEDY

a) Make sure the copper level is 0.3 PPM or higher
b) Make sure the pH is less than 7.6
c) Backwash the sand filter or clean the cartridge filter
d) Shock the pool with an unstabilized chlorine
e) Run the pump filter for at least 72 continuous hours

WHITE CLOUDY WATER can be caused by

a) Organic loading from body oils, persperation or suntan lotion

b) Poor circulation or filtration

c) High Ph

d) High total alkalinity

e) High total solids

f) Recently installed ion system

REMEDY: (by corresponding letter)

a) Add an oxidizing agent such as liquid chlorine, Oxy-Brite, Oxy-Out or Shockline
b) Run the pump and filter continuously, backwash sand filters and clean cartridge filters
c) Test the pH and add dry acid such as pH Down if it is over 7.7
d) Test the total alkalinity and add liquid muriatic acid if it is over 120 ppm. (turn the pump off and add small amounts to numerous places in the water.)
e) High total dissolved solids over 1800 ppm can only be reduced by diluting water. Sometimes a water clarifier or flocculent will help.
f) Sometimes the ionization process will react with existing chemistry in water. Cloudy water occurs with older equipment and previous bromine use. This is a short term problem which will rectify itself in 3-7 days. Run the pump and filter continuously. Backwash sand filters and clean cartridge filters frequently.

ALGAE

In vinyl pools the walls will be slippery. In concrete or gunite pools, there will be green marks at various places around the pool.

ALGAE can be caused by:

a) High pH
b) Low copper
c) Too much sequestering agent
d) Copper resistant strain of algae

REMEDY (by corresponding letter)

a) Test the pH and decrease it with dry acid if it is over 7.6. Verify the total alkalinity is less than 120 ppm.
a) Test the copper level and turn the unit up if the copper level is less than 0.3 ppm. In some cases a copper level of 0.5 or 0.6 ppm may be required. For example, if there are a lot of trees or shrubbery close by, high pollen counts or excessive consistent bather loads.
b) Products like Cop-Out, Min-Arrest and Sequasol are designed to attack the copper ion in water. If these products are used the ion system will not function properly. Sequestering agents just mentioned will slowly dissipate from the water over a 2 to 3 week time period. The use of chlorine or a non-copperbased algaecide will be needed to contain the algae growth until the sequestering agent has left the water.
c) Some algae has built up an immunity to copper ions. If this strain of algae grows, then an unstabilized chlorine shock treatment will be required.
d) In all cases, a shock treatment of unstabilized chlorine will normally kill the growth.

DISCOLOURED WATER

b) Red/brown water is usually high iron, while
c) Green water normally can be traced back to algae or caused by high combined copper.

REMEDY: (by corresponding letter)

a) For iron, the use of Metal Magnet, M.S. R., Min-Arrest or Sequasol or similar product will remove the iron. These products can also remove or disrupt the ability of ions to kill algae. Therefore, algae may develop and a chlorine shock treatment will be required.
b) For algae, see the "Algae section" For high combined copper,turn off the ionization system and wait for the copper to dissipate through normal use. If the high copper level has started to stain the equipment, follow the remedy described in 10A above.

Stains of various colors and sizes are almost inevitable on pool walls. There are a number of causes and covering them all is difficult. Some common causes are water balance, organics such as leaves and fertilizers, and uncontrolled or excessive metals

Calcium deposits can form when the chemical balance is not monitored carefully. Calcium in a pure state is white but will easily be stained by copper, dirt, and other water borne impurities.

Another source of staining can come from certain types of algae. Most algae are of a green or yellow variety and are easily eliminated by the ionization process. The algae will form protective bioshield which can make it resistant to ion or chemical treatment. In advanced outbreaks of algae brushing of the spots followed by a chlorine shock and algaecide may be needed to eliminate the algae. The final step that can be taken in extremely severe cases of algae and stains in a gunite pool may be an acid bath of the pool walls.

Vinyl pool liners, especially older liners, are very susceptible to stains. The vinyl material used in the liners is very porous in nature. Chlorine will act to leach out the polymers used to create the material. The result of this process is an initial fading of the vinyl and eventual disintegration of the liner. During this process, the material becomes very susceptible to permeation by both minerals and algae stains.

With the ionization technology and the proper water chemistry balance as mentioned earlier, staining from copper ions should be minimal.

Acrylic pools are not prone to stains, although misuse of chemicals can destroy the finish.

Stains can be almost any color but most predominant are brown, green or black.

BROWN stains can be:

a) Iron or rust marks
b) Mustard algae. If the spot brushes off very easily but comes back in the same spot, it is probably mustard algae.

REMEDY: (by corresponding letter)

a) For iron spots, turn the pump off and sprinkle some granular pH reducer directly onto the spot. Wait 5 minutes then brush the spot, If the brown stain is all over the pool, lower the pH to 7.0 or less and wait a couple of days. Sometimes a low pH will re-dissolve metal precipitation back into the water.
b) If mustard algae is growing, it is probably due to a pH over 7.6, a total alkalinity over 120 ppm, or a copper level less than 0.3 ppm. Correct the parameter which is out

of tolerance and wait a couple of days for the algae to be killed.

Green stains can be:

a) Copper precipitation if it covers all of the pool,is usually caused by a high pH or a high copper concentration.
b) Green algae if the stain is only in a few locations.

REMEDY: by corresponding letter)

a) To remove copper precipitation, lower the pH to 7.0 or less for a couple of days. Sometimes a low pH will re-dissolve the copper back into the water. For quick results, turn the pump off and add Easy-Down or some granular pH reducing product directly onto the stained areas. Sprinkle handfuls across the surface of the water and wait 10 minutes. The stains will come out on contact. Concrete or gunite pools may require a special procedure called a no-drain acid wash.
a) Green algae is the most common algae. Make sure the pH is less than 7.6, the total alkalinity is less that 120 ppm, and the copper level is more than 0.3 ppm. Refer to the "algae section" for a remedy.

BLACK stains can be:

a) Copper stains due to a pH over 7.6 or a total alkalinity less than 60 ppm
b) Dirt
c) Algae
d) Black spots after shocking the water

REMEDY: (by corresponding letter)

a) Turn the pump off and sprinkle Easy-Down or a granular pH reducer directly onto the black spots. Wait 10 minutes and brush the spot. If the stain persists, with the pump still off, put 250ml or a cup of granular pH down into the water directly above the stain. Immediately put 50ml or 1/4 cup of lite-sock or a lithium-based granular chlorine into the water above the spot. Wait 10 minutes and brush the spot. Concrete or gunite pools may require a special procedure. This will require a service call from an authorized service representative.
b) Vacuum the dirt.
c) Vigorously brush the pool. Follow the brushing with algaecide or an unstabilized chlorine shock treatment.
d) Did you recently shock the water with chlorine? Chlorine can knock copper ions out of solution. Especially if the pH is over 7.6, the total alkalinity is below 60 ppm, or the copper level is over 0.7 ppm, chlorine oxidizes the ions, turns them black, and drops them to the bottom of the pool. Turn the pump off and sprinkle Easy-Down, or a granular pH reducer directly onto the back spots. Wait 10

minutes and brush the spot. Concrete or gunite pools may require a special procedure. This may require a service call from an authorized service representative. Adjust the total alkalinity to 100, wait one day, and adjust the pH to between 7.2 and 7.4.

CALCIUM HARDNESS PROBLEMS

Recommended Levels, 200 -275 ppm for gunite or concrete pools, less than 350 ppm for vinyl pools.

The term "hardness" comes from past folk terms. Water that contained high levels of calcium and/or magnesium consumed soap, forming a grey insoluble curd, before suds were formed. That is, this water was "hard to form suds". Rainwater gathered for laundry use, formed suds readily and was called "soft water".

LOW CALCIUM HARDNESS CAN CAUSE

aggressive water pitting of concrete
metals stripped
staining
low copper reading

HIGH CALCIUM HARDNESS CAN CAUSE

scaling
short filter runs reduced circulation cloudy pool
over Ionization

TOTAL ALKALINITY PROBLEMS

Optimum between 80 and 120ppm
Total alkalinity is the measure of the ability of a body of water to resist changes in pH. That is the ability to "buffer" water from wild swings in pH. It is essentially a measure of dissolved bicarbonate in pool water. T.A. is the governor of pH.

LOW TOTAL ALKALINITY CAUSES	HIGH TOTAL ALKALINITY CAUSES:
corrosion	scaling
pitting of concrete	short filter runs
metals stripped	reduced circulation
staining	cloudy pool
pH hard to control	pH Drift to 8.4 I ion inefficiency

CORRECTION OF PARAMETERS

	TOTAL ALKALINITY	CALCIUM HARDNESS	Ph
TO INCREASE	Sodium Bicarbonate	Calcium Chloride	Sodium Carbonate
TO DECREASE	Muriatic Acid	Dilution	Sodium Bisulphate

DECREASING Ph

ADD SODIUM BISULFATE (Dry Acid)

METRIC TABLE

Litres of Pool Water

PH	2,000 L	20,000 L	40,000 L	80,000 L	200,000 L
7.4	15.00 g	150.00 g	300.00 g	600.00 g	1.5 kg
7.6	30.00 g	300.00 g	600.00 g	1.20 kg	3.00 kg
7.8	45.00 g	450.00 g	900.00 g	1.80 kg	4.50 kg
8.0	60.00 g	600.00 g	1.20 kg	2.40 kg	6.00 kg
8.2	75.00 g	750.00 g	1.50 kg	3.00 kg	7.50 kg
8.4	90.00 g	900.00 g	1.80 kg	3.90 kg	9.00 kg
8.6	105.0 g	1.05 Kg	2.10 kg	4.20 kg	10.50 kg

ADD SODIUM CARBONATE

METRIC TABLE

Litres of Pool Water

PH	2,000 L	20,000 L	40,000 L	80,000 L	200,000 L
7.0	7.50	75.00 g	150.00 g	300.00 g	750.00 g
6.8	15.00 G	150.00 g	300.00 g	600.00 g	1.50 kg
6.6	22.50 G	225.00 g	450.00 g	900.00 g	2.25 kg
6.4	30.00 G	300.00 g	600.00 g	1.20 kg	3.00 kg
6.2	37.50 G	375.00 g	750.00 g	1.50 kg	3.75 kg
6.0	45.00 G	450.00 g	900.00 g	1.80 kg	4.50 kg

INCREASING CALCIUM HARDNESS

ADD CALCIUM CHLORIDE

METRIC TABLE Litres of Pool Water

Desired increase in ppm

	2,000 L	20,000 L	40,000 L	80,000 L	200,000 L
10 ppm	30.00 g	300.00 g	600.00 g	1.20 kg	3.00 kg
20 ppm	60.00 g	600.00 g	1.20 kg	2.40 kg	6.00 kg
30 ppm	90.00 g	900.00 g	1.80 kg	3.60 kg	9.00 kg
40 ppm	120.00 g	1.20 kg	2.40 kg	4.80 kg	12.00 kg
50 ppm	150.00 g	1.50 kg	3.00 kg	6.00 kg	15.00 kg
60 ppm	180.00 g	1.80 kg	3.60 kg	7.20 kg	18.00 kg
70 ppm	210.00 g	2.10 kg	4.20 kg	8.40 kg	21.00 kg

Decreasing calcium hardness is done by dilution

INCREASING TOTAL ALKALINITY

ADD SODIUM BICARBONATE (BAKING SODA)

METRIC TABLE

Litres of Pool Water Required Increase in ppm

	2,000 L	20,000 L	40,000 L	80,000 L	200,000 L
10 ppm	36.0 g	360.00 g	720.00 g	1.44 kg	3.60 kg
20 ppm	72.0 g	720.00 g	1.44 kg	2.88 kg	7.20 kg
30 ppm	108.0 g	1.08 kg	2.16 kg	4.32 kg	10.80 kg
40 ppm	144.0 g	1.44 kg	2.88 kg	5.76 kg	14.40 kg
50 ppm	180.0 g	1.80 kg	3.59 kg	7.18 kg	18.00 kg
60 ppm	216.0 g	2.16 kg	4.31 kg	8.62 kg	21.60 kg
70 ppm	252.0 g	2.52 kg	5.03 kg	10.10 kg	25.20 kg
80 ppm	288.0 g	2.88 kg	5.75 kg	11.50 kg	28.80 kg
90 ppm	324.0 g	3.24 kg	6.47 kg	12.90 kg	32.40 kg
100 ppm	360.0 g	3.60 kg	7.19 kg	14.40 kg	36.00 kg

DECREASING TOTAL ALKALINITY

ADD MURIATIC ACID

METRIC TABLE

Litres of Pool Water Required increase in ppm

	2,000 L	20,000 L	40,000 L	80,000 L	200,000 L
10 ppm	32.5 mL	325.00 mL	650.00 mL	1.30 L	3.25 L
20 ppm	65.0 mL	650.00 mL	1.30 l	2.60 L	6.50 L
30 ppm	97.5 mL	975.0 mL	1.95 L	3.90 L	9.75 L
40ppm	130.0 mL	1.30 L	2.60 L	5.20 L	13.00 L
50 ppm	163.0 mL	1.63L	3.26L	6.52 L	16.30L
60 ppm	195.0 mL	1.95L	3.90L	7.80 L	19.50L
70 ppm	228.0 mL	2.28L	4.56L	9.12 L	22.80L
80 ppm	260.0 mL	2.60L	5.20L	10.40 L	26.00 L
90 ppm	293.0 mL	2.93L	5.86 L	11.70 L	29.30L
100 ppm	325.0 mL	3.25L	6.50 L	30.00 L	32.50L

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