

**Triangularwave  
Technologies,  
Inc. (TWT®)**

**Versatile Fluid  
Management  
Products & Systems  
To Effectively Meet  
The Needs Of Any  
Industry &  
Application**

- Control Scale Deposits
- Bacteria
- Corrosion
- Algae
- Colloids

In All Fluid Based Systems

Homes

Office Complexes

Custom & Luxury Homes

Refurbished Homes

Water Front Properties

House Boats

Retirement Communities

Mobile Home Complexes

Enhance Water Quality, And Improve Operating Efficiency And Equipment Life Cycle

Protect Plumbing Equipment & Appliances

Environmentally Friendly

Cleaner Water Is Healthier Water

# Do You Have A Safe And Effective Water Treatment System?

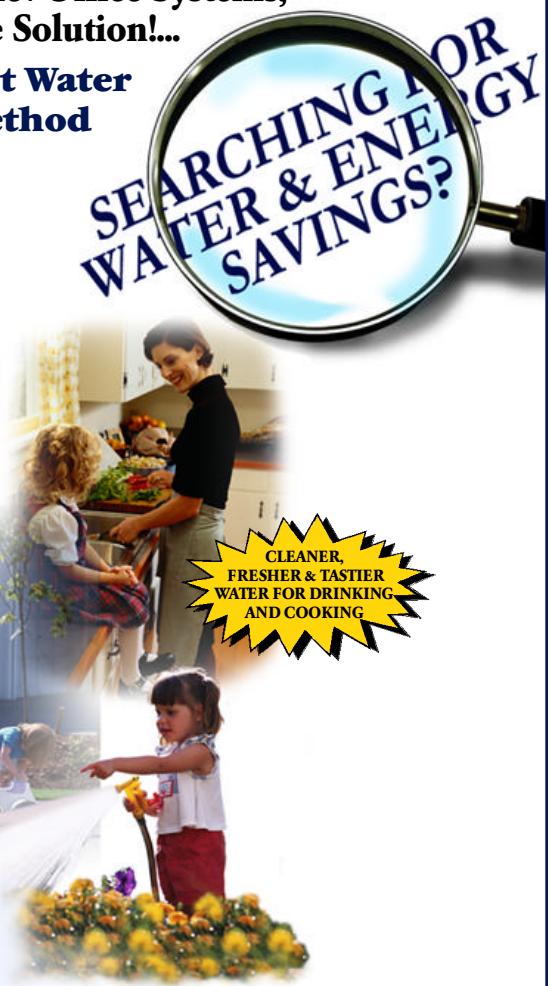
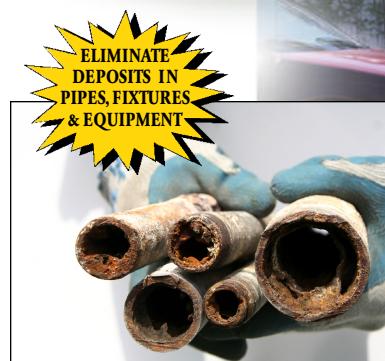
**Lots of Companies Provide Products and Systems...TWT, Inc.  
Senses Environmental Needs with Intelligent Solutions!**

**Comprehensive Whole Home/Office Systems,  
Your Simple And Safe Solution!...**

**TWT® The Smart Water Treatment Method**

**The Green Market Answer: Chemical-Free**

**Filtration**



**Hard Water Conditioning & Treatment**



**Disinfection & Purification**



# Ensure that the water in your home or office is safe enough to use and drink.



**Improve the quality & taste of your water, with TWT® technologically advanced water filtration, conditioning and purification treatment, Systems, your simple and safe solution.**

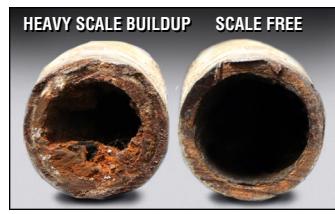
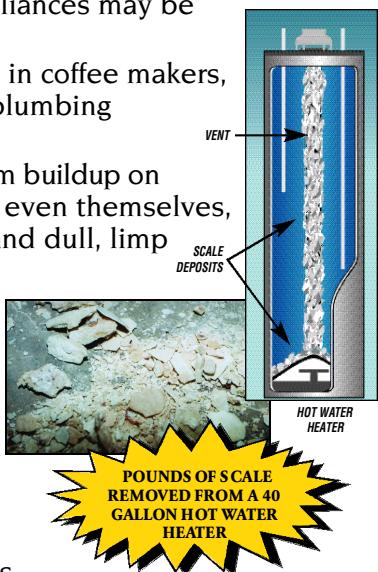
Hard water is the most commonly reported water quality problem by consumers in the U.S., found in over 85 percent of the country. Over 60% of the earth's water is groundwater, which picks up minerals, rocks and soil, including calcium and magnesium contaminant's that make water hard.

## SOME TELLTALE SIGNS THAT WATER MAY BE HARD:

- Clogged pipes and/or appliances may be due to hard water.
- Mineral deposits can form in coffee makers, shower drains, pipes and plumbing equipment.
- Consumers may notice a film buildup on shower tiles, bath tubs, or even themselves, which can cause dry skin and dull, limp hair.
- Heating bills are increased, because the hard water forms an insulated shell between the heating element and the water to be heated. Heated hard water causes scale.

To understand how to solve water-related problems, it is necessary to understand what causes these problems.

Although water is basically H<sub>2</sub>O (a simple combination of hydrogen and oxygen), by its very nature it is highly receptive to many other substances that complicate and contaminate this simple mixture.



## THERE ARE THREE BASIC CAUSES OF WATER/FLUID RELATED PROBLEMS

### Scale

#### Problems:

- Loss of heat transfer efficiency**
- Flow restriction in pipes and frozen valves**
- Back pressure increases energy needed to pump**
- Reduced reaction vessel capacity**
- Localized corrosion**
- Visible surface scale objectionable**

### Adverse Water Chemistry

- Problem: • **General corrosion**

### Biofilm

- Problems: • **General corrosion • Bio-corrosion (both general and local)**  
• **Sludge • Disease and odors • Bacteria, Algae, Fungus, etc.**

### The End Results of Water Problems

- **Wasted water • Ruined equipment • High energy costs**
- **Productivity losses • Product contamination or quality problems**
- **Disease and odor in the water environment**

### Materials That Deposit on Equipment and Cause Water/Fluid Problems

Materials may be animal, vegetable, mineral, or corrosive water chemistry. The sources of the materials include: pollution, wind borne dirt, algae, chemical additives, viruses and bacteria that occur abundantly in the natural environment, and process components themselves. Some of the materials can grow, such as bacteria, algae, fungus, etc. A growing list of man-made poisons includes pesticides, herbicides, chemical fertilizers, auto emissions, industrial waste, etc.

### Treatment

#### Scale, Adverse Water Chemistry & Biofilm Can Cost You Money!

Untreated fluid used in boilers, hot water systems, cooling towers and other fluid related equipment contains dissolved salts, gases and traces of many minerals and metals. These elements are the direct cause of scale buildup in pipes and equipment. If left untreated, scale buildup can increase fuel costs, repair and ongoing cleaning costs, downtime and may eventually result in significant equipment replacement. The bottom line is that if the problem-causing materials are controlled, then 85% to 90% of the problems are eliminated. Treatment options include **removal** and **control**.

- **Removal involves physical or chemical cleaning, filtration, ion exchange, softening, demineralization, reverse osmosis.**
- **Control involves adding chemicals or ozone, or electro-magnetically conditioning the water.**

### What do I have to Know

**Selecting a system that meets your needs is an important step. However, it is not as simple as reading a few ads for various filters and other treatment systems, or looking at a few samples, and/or industry catalogs.**

The most effective fluid treatment systems utilize a variety of both removal and control methods depending upon the specific nature of the system/water being treated and its intended use. These combinations of techniques can be deployed to effectively solve your specific problems and can be designed to function together in a way that will enhance the effectiveness of each component in achieving the desired results.

## Selecting a System for Your Needs

### A comprehensive approach to selecting a fluid treatment system includes:

- Testing your water or fluid to determine the specific problems in it and your area
- Selecting the system and/or components of a system that will solve these problems
- Installing and monitoring your system
- Periodically re-testing to insure that your old problems are being treated and controlled, and that new problems have not developed.

## Installing and Monitoring Your System

A qualified engineer, plumber (and sometimes an electrician) is often required to install the system you select. It is recommended that you carefully review the owners manual and other literature accompanying your various components, and develop a thorough understanding of what you have. This little bit of extra effort is well worth your time and attention. Then prepare a service schedule (put it on your calendar) to insure that you are replacing filters, UV lamps, or other components as recommended by the manufacturer.

## Testing

Although the testing approach may seem bothersome, it is like a good routine physical by a health-care specialist. Avoiding this step is to assume that "what you don't know won't hurt you." Sorry, but it will! Avoiding the truth may result in health problems and costly repairs to your plumbing system and other equipment.

## Periodically Re-test and Evaluate Performance

Simply owning a water treatment system does not guarantee that your water will be safe forever. In addition to monitoring your system and providing for replacement of parts, you also need to periodically test and re-evaluate the quality of the water coming into your system to determine if changes or upgrades are needed. The ultimate responsibility is yours.

### TRIANGULARWAVE TECHNOLOGIES, INC. CHEMICAL-FREE FLUID MANAGEMENT SOLUTIONS

TWT provides all the methods and components necessary for a comprehensive approach to water and fluid treatment. We recommend that you apply components from the filtration, deposit control, purification and disinfection categories (as needed) to obtain the highest levels of results. At the core of the product line is our patented TWT Deposit Control technology, around which you should deploy products from the rest of the treatment methods.

The Triangularwave System represents a significant breakthrough in electromagnetic technology. The Triangularwave has made possible the use of electromagnetic technology in applications of all sizes, from residential to large commercial and industrial applications. As an advanced system for controlling scale and bio-fouling, it is applicable with once-through and recirculating HVAC, heating and process cooling systems, as well as agricultural, industrial processing, wastewater, and other fluid-based systems.

**This technologically advanced electronic deposit controller provides continual scale and bio-film control in fluid systems resulting in reduced maintenance and more efficient operation. The Triangularwave System utilizes unique and proprietary treatment and design processes.**

### Patented Triangularwave Technology

The Triangularwave System represents an advanced method for controlling scale and bio-fouling. The electronic deposit control technology uses a signal coil that is wrapped around a pipe in the plumbing system being treated. The signal coil produces an extremely small time-varying magnetic field inside the pipe. The resulting induced, oscillating electric field provides the necessary molecular agitation for chemical-free scale prevention and removal.

The basic component in the TWT systems is the deposit controller. It is comprised of a microprocessor, solenoid coil wrap and/or a reaction chamber. The microprocessor is a patented controller that functions like a computer to relay a continuous electrical power supply to the solenoid coil and/or reaction chamber. The reaction chamber is plumbed into the main water in-take line and/or just before each piece of vital processing equipment, and provides a factory wrapped wire coil forming a solenoid. The solenoid conveys the triangularwave signal at the appropriate power level (as allowed by the model chosen) to the water passing through the chamber.

This signal constantly changes the polarity, frequency, and amplitude of the current entering the water. This triangular wave treatment produces several benefits. It increases the capability of the water to hydrate scale ions and other colloidal particles. In effect, the surface charge of the hydrogen molecules is enhanced and the water is made "wetter". This "hydrated" water can dissolve unwanted particles, suspend them in solution, and allow them to be easily filtered out or flushed from the system. Accordingly, the mineral and biological particles that cause scale, deposits, and corrosion are dissolved and washed away. This means that the breeding environments for bacteria, such as bio-film and corrosion, are eliminated.



**In effect, a clean, corrosion-free delivery system is restored and maintained in an environmentally safe and chemical-free manner.**

**The result is clean pipes and tubing with no biofilm and reduced bacterial contamination.**

### Benefits of the Triangularwave System

#### PREVENTS SCALE BUILD-UP

- Scale particles in the water receive an enhanced surface charge that causes them to repel each other and from the walls of the equipment

#### ELIMINATES TOXIC CHEMICALS/SALTS

- No recurring chemical expense
- No handling and storage of hazardous chemicals on site
- No hazardous salt contamination

## REDUCES CORROSION

- Reduces bio-corrosion by preventing the formation of bio-growth on vessel surfaces where bacteria can attack the metal
- With higher concentration ratios and TDS, the pH will be higher and there will be much less tendency for corrosion
- Prolongs life cycle of equipment
- Increase operating efficiency of equipment

## CONTROLS ALGAE AND BACTERIA

- Bacteria and algae must attach to something before they can feed and reproduce. The Triangularwave System keeps the bacteria, algae, and their food dispersed in the water, off of surfaces, and away from their biofilm breeding ground
- Without biofilm to house and protect it, biological growth can not feed or reproduce, resulting in greatly reduced biological activity
- Within hours the biofilm will die, too

## SHORT PAYBACK PERIOD

- The combined reduction of water and chemical costs is enough to pay for the triangularwave system in as little as 9 to 18 months
- With the Triangularwave Treatment, the systems can run at higher concentration ratios, meaning the amount of water removed as blowdown and the corresponding sewer charges are greatly reduced
- With no chemicals being added, the requirements for pretreatment of blowdown are eliminated
- Labor costs for maintaining the chemical systems will be reduced
- Labor costs to clean the vessel surfaces will be reduced
- Costs to replace corroded parts will be reduced
- The Triangularwave System requires no maintenance
- There is little electrical current flow in an electromagnetic system
- Reduces energy costs

## Results of Using the TWT Triangularwave System

The constant battle of monitoring and cleaning cooling and heating systems becomes a thing of the past:

## REDUCED MAINTENANCE

- Balancing the water chemistry on a daily or weekly basis may no longer be necessary
- Cleaning of the vessels is much easier, involving a pressure wash one or two times a year rather than the extensive manual brushing and acid washing traditionally required
- The Patented Triangularwave System assures effective treatment

## REDUCED ENERGY REQUIREMENTS - OBTAIN COST SAVINGS FROM 3% TO 30%

- Water systems are kept free of deposits, allowing heat transfer at its most efficient, and eliminating the insulation caused by the presence of scale and biofilm
- The roughness and reduced flow caused by the presence of scale is eliminated, reducing the energy needed to drive the pumps

## REDUCED SEWER, MUNICIPAL, PRETREATMENT, AND WATER FEES

- Municipal penalties and treatment fees for chemical content in blowdown of cooling systems are reduced or eliminated, since there are no longer chemicals present; if pretreatment has been in place, it is no longer necessary
- Blowdown itself and its water costs are also reduced because higher TDS ratios are acceptable
- The often negative side-effects suffered by equipment from chemicals and sodium used for treatment no longer exist, since the chemicals and sodium are no longer necessary

## SAFETY AND HANDLING ISSUES ELIMINATED, ENVIRONMENTAL ISSUES SUCCESSFULLY ADDRESSED

- The workplace and workers are safer because personnel are not handling harsh chemicals
- OSHA issues related to chemical fluid treatment no longer apply, since chemicals are no longer used
- Legislative and regulatory directives regarding commercial and industrial effluent output are more easily met
- Corporate citizenship and environmental support goals are more easily met

## THE TRIANGULARWAVE SYSTEM GIVES OWNERS ALL OF THE BENEFITS OF SOFT WATER WITHOUT THE HARMFUL SALTS

The TWT Deposit Control is a new, revolutionary breakthrough in the treatment of hard water and its effect on water-based applications. The system is non-invasive and non-chemical by design, and is suitable for practically all applications requiring water/fluid treatment.

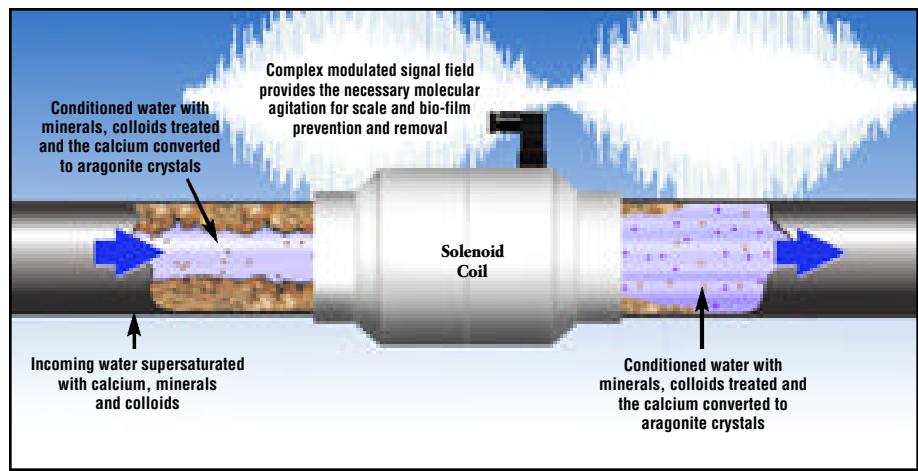
### Sources of Water

Water primarily comes from two sources, the bodies of water on the earth's surface and the subterranean wells which gather groundwater after it is filtered through the top layers of the earth's strata. After the groundwater passes through the uppermost layers of the earth's surface, it contains carbon-dioxide ( $\text{CO}_2$ ), a carbonic acid. In the lower strata of the earth, the carbonic acid-enriched water dissolves lime ( $\text{CaCO}_3$ ) from the subterranean rock and converts it to calcium-hydrogen carbonate. The calcium-hydrogen carbonate is the source of lime deposits and encrustations (scale) which form in water systems.

### Hardness in Water

Regardless of the source of water, water typically contains carbon-dioxide ( $\text{CO}_2$ ) and the earth's alkalines, such as calcium and magnesium. The total hardness of water is determined by the sum calcium-hydrogen carbonate, magnesium-hydrogen carbonate and the non-carbonate starches which include calcium and magnesium component solutions. Consequently, the water "hardness" is dependent upon the amount of lime in the water.

Triangularwave technology prevents the formation of lime deposits using an electronic deposit controller, which generates an electronically modulated frequency, and an amplified, triangulated waveform. The wave is then oscillated to change the separation characteristics of calcium and carbonates before they enter the water system, immediately neutralizing the hardness, and functionally "softening" the water. The process is purely physical as it uses no chemical additives.



By this reaction, the minerals, colloids and crystals lose their adhesive properties and remain in suspension in the liquid. Pre-existing scale is taken back into solution and removed in the same way. The effects are immediate and long lasting downstream.

**Note:** For additional support visit TWT website: [triangularwave.com](http://triangularwave.com) and review this technical document: "TWT's Installation & Technical Guidelines".

## The Triangularwave Deposit Control System Will:

1. Give the benefits of soft water without adding harmful salt or removing health giving minerals
2. Prevent any further hard scale build-up in and on water-fed equipment and fixtures
3. Remove the existing scale that is inside the water system over a short period of time
4. Soften the existing hard scale around taps, basins, and toilets, etc.
5. Reduce soap scum and improve the lather of soap. Make the water to feel silkier
6. Reduce the harsh effects of hard water on skin and clothes
7. Reduces water spotting on fixtures and surfaces in contact with the water
8. Provides a much more environmentally friendly solution to hard water – no salts or chemicals
9. The water will taste better, as pipes will be cleared of both mineral and biological deposits
10. Plants that receive the treated water will grow better

The key to the systems success and its unique approach is that different particles respond to different frequencies and amplitudes of the signal. The microprocessor rapidly varies the frequency and amplitude of the signal to deliver the various combinations to treat nearly 100% of the particles in the water.

Bacteria and scale-forming colloids in the water receive a strong boost in their natural surface charge. The particles repel one another and remain in stable suspension, rather than uniting to form scale or colonizing to form biofilm or other system fouling. The Triangularwave Deposit Control System treats all incoming water as it passes the coil and alters the characteristics of the calcium so that it does not stick and form hardscale .It is important to remember that the calcium is still in the water and will be visible in appliances that are not subject to free flowing water.

## Use With a Salt Water Softener

If a salt softener is currently being used, it should be disconnected, and the plumbing bypass valves should be opened/closed, to experience the sole effect of the **Triangularwave System**. If the softener is not bypassed, the Triangularwave System should be installed downstream of the softener, or else the calcium held in the ion exchange bed will quickly redissolve, causing a flood of extra-hard water. It is recommended that salt softening be eliminated for the best possible economic and ecological results.

## External Scale

It is a good idea to use external scale as a tracking reference to determine whether or not the system is working. Areas to identify for this are:

1. Scale around taps, sinks, etc. will begin to soften, provided that the newly treated water is in regular contact with the area. Once softened, these deposits can be removed using a stiff scouring pad, or other appropriate devise
2. Surfaces in contact or splashed with water become easier to clean
3. Scale on showerheads softens and can be removed. During descaling, some deposits may collect inside the nozzle. These can easily be rinsed away
4. Water spotting on fixtures and surfaces will begin to diminish

## Internal Scale

1. As the hot water heating coil is descaled, water heating will become progressively more efficient. The descaled heater coil will heat the water faster. Therefore, it is possible to save considerable energy by reducing thermostat settings

2. If the water system was severely scaled, an improvement in water flow also may occur

## Important Notes:

1. For some time after installation, the unit will be descaling pre-existing scale in the water system. This often results in the water appearing to be harder, and calcium deposits increase in places like shower-heads. Once descaled inside, the water system will be scale-free and calcium marks outside the system should easily wipe away.
  2. TWT Deposit Control Systems use Molecular Surface Energy Realignment to neutralize the dissolved calcium carbonates that causes hardness. MSER uses the resonant energy forces that are developed on charged particles, the dissolved ions, moving in electro-magnetic fields to alter the molecular surface energy states.
- Surface energy states determine how physical crystals form during precipitation. In this case, ionic calcium carbonate is treated so that electrically neutral aragonite is formed rather than calcite, or lime stone. Both calcite and aragonite ( $\text{CaCO}_3$ ) are chemically identical. These two crystals simply have different physical structures and therefore behave differently. One causes hard water and the other does not. Now, soaps will really lather, soap scum is greatly reduced, and the water feels silkier, not oily or slimy as salt softened water commonly does.
2. Water Softeners - Water softeners often leave deposits inside a water system; therefore if a softener is in use, allow the Deposit Control System to remove the deposits before the softener is switched off. In that case, leave the softener and the Deposit Control System on together for about 1or 2 months. Remember, install the TWT deposit Control unit down stream of the water softener, if planning to run them together.

## Typical User Experiences . . . Silky Water Feeling

The treated water is immediately altered and will start dissolving scale build-up in the pipes. The scale dissolves one particle at a time, therefore there are few problems with clogging filters or screens in the plumbing system. If a water softener was never used before, the water user will experience a dramatic difference in the "feel" of the water. The water will have a silky feeling, and hair will be "squeaky clean" after a shampoo.

## Soap, Scum, and Skin Effects

As the hard water effects of the calcium diminish, you will usually notice:

1. A reduction of around 30% in soap and detergents needed
2. Less water spotting on fixtures and surfaces in contact with water
3. Less scum formed on the bathtub, and an improved soap lather
4. A great improvement in skin condition for anyone suffering from dry skin. Even those with normal skin can expect improvements and reduction in the use of hand creams, etc.

## Chlorine

It may be smelled as it dissipates in the air, (if the water has been chlorinated) because the **TWT Deposit Control System** reduces the surface tension of the treated water. The chlorine controls organisms inside the plumbing, however, it is not good for people, their hair, skin or internal organs. Therefore, it is ideal to have the chlorine perform its function in the water, and then have it dissipate before drinking or bathing.

## Water Taste

Users of the **TWT Deposit Control System** will notice improvement in the taste of their water, due to cleaner pipes and the softening effect. Water used in coffee, drinks, ice cubes, and for cooking will taste better.



## Replacing a Salt-Based Water Softener

If a salt softener is replaced, the user may notice the water becoming harder as the scale begins dissolving. Do not worry, this is a consequence of descaling, and the condition will improve daily as the scale is removed. The plumbing took years to get full of scale; however it only takes a short time to clean it up with the **Triangularwave System**. This period may be brief for a newer facility, or several months for older facilities with low water usage. It is recommended that water heaters be drained regularly to shorten the descaling process. The shorter the descaling period, the more money will be saved.

### First Ninety Days\*

Descaling should be complete, and you will be left with:

1. Soft feeling water from every tap/system
  2. Clean pipes
  3. A savings in energy and detergent expenses
  4. Cleaner, fresher water for drinking, cooking and processing
  5. Less water spotting
- \* Depending on preexisting conditions

### Typical Customer Questions . . . What does a softener do that an electronic deposit control system does not?

1. The water softener removes calcium from the water by replacing the calcium with sodium (salt)
2. The softener gives a feeling that one cannot get rid of soap from one's body
3. The water softener makes skin dry
5. The water softener requires that salt be purchased and replaced periodically
6. Water softeners contribute to negative environmental conditions and are banned in many communities
7. Water softeners require on-going maintenance

### What does the Triangularwave System do that a water softener does not?

1. The Triangularwave System gives all of the benefits of softened water without the salt
2. It removes calcium build-up in hot water heaters (Saves energy costs and extends the life of the heater)
3. Saves money (No salt purchases)
4. Provides salt-free water, a concern for many health conscious people

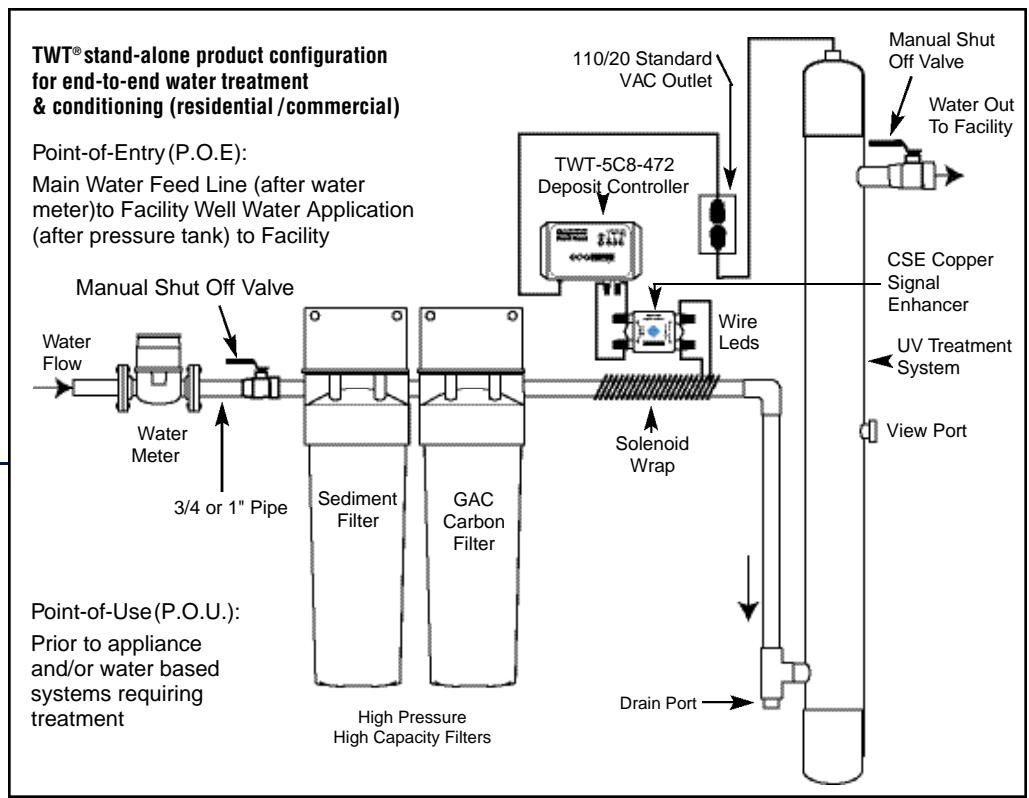
5. Provides clean water, while eliminating the discharge of salt-laden water into the watertable as a result of the normal regeneration cycle of conventional water softeners—it's environmentally friendly
- 6 Reduces the consumption of detergents and shampoos, a big benefit for the environment
7. Removes both mineral and biological deposits, but leaves the benefits of the minerals, so water used is cleaner and healthier
8. Reduces water spotting on fixtures and surfaces
9. Does not require on-going maintenance

### If there is a water softener already installed, how should the Triangularwave System be installed?

### Is it possible to use both a water softener and the Triangularwave System?

It is possible to use both a water softener and the TWT Deposit Control System. The Deposit Controller should be installed "downstream" of the water softener, because it will cause the calcium ions attached to the ion exchange resin to be released back into the water. Because existing scale build-up in the plumbing will be dissolved into the water, the use of a water softener may help to diminish the effects of this increase in hardness. After approximately 1 or 2 months, put the softener on "by-pass".

### TWT® Filtration • Deposit Control Technology Ultra Violet (UV) Disinfection & Purification Combined for Maximum Effectiveness



TWT stand-alone products will vary in size, capacity and gpm treatment requirements (above schematic rendering not to scale, for reference only).

TWT® has the versatile, efficient, cost-effective methods to solve your water/fluid management problems end to end.

### TWT® The Ultimate in Water Treatment & Conditioning

### TWT® “The Competitive Edge”

### Go Green-Save Green



## TWT® Multi-Process Water Filtration, Conditioning, Treatment and Purification Technology



All-In-One Fluid Treatment Kits:  
Filtration • Deposit Control Technology  
• Ultra Violet (UV) Disinfection &  
Purification Combined for Maximum  
Effectiveness

**Triangularwave Patented Deposit Control System (TWT®)**  
**Technologically Advanced Method for Water & Fluid Management...**

### CHEMICAL-FREE

### Your Simple and Safe Solution

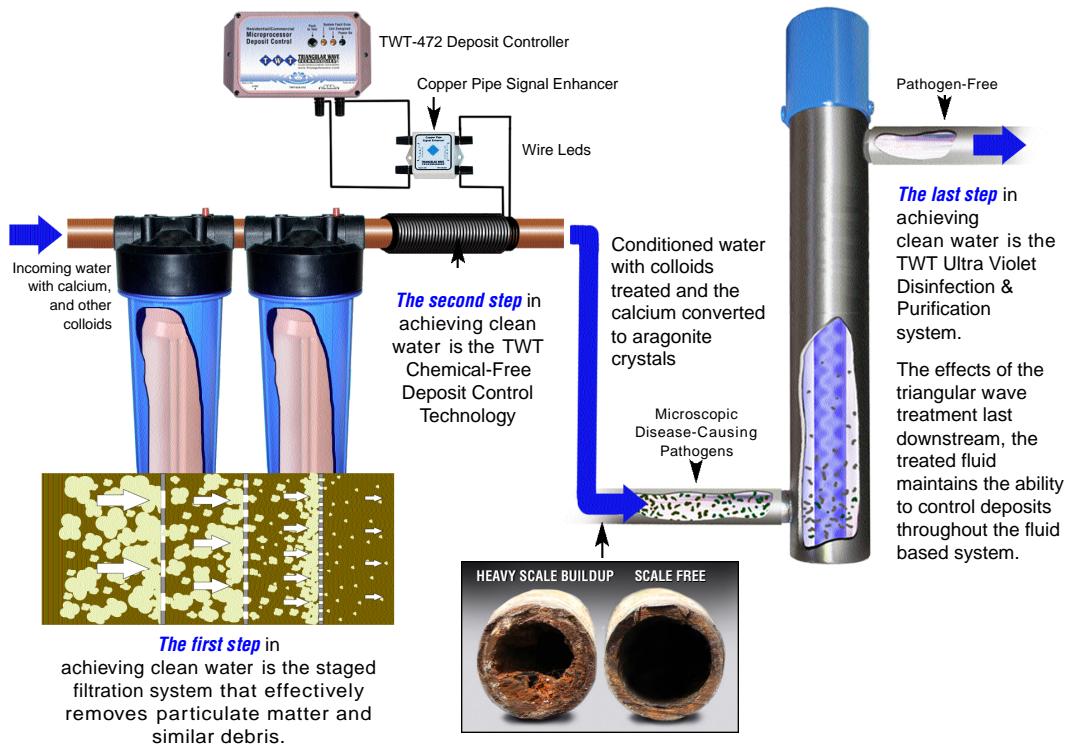
- **Eliminates Deposits in Pipes, Fixtures and Equipment**  
(Softens and removes hard scale build-up around plumbing fixtures)
- **Controls Algae and Bacteria**  
(Prevents the formation of biofilm, the breeding ground for algae and bacteria)
- **Reduces Soap Scum and Improves Lather of Soap**
- **Reduces Detergent and Soap Use**
- **Reduces Effects of Hard Water on Skin and Clothes**
- **Salt and CHEMICAL-FREE Water Conditioning**

- **Easy to follow application & installation manual**
- **Available in 110/20-V or 220/30-V (Must Specify with Purchase Order)**
- **Removes Existing Scale on Heat Exchangers Over Time, Which Improves Heat Transfer for Greater Efficiency (Cost Effective)**



TWT Microprocessor Deposit Control Systems represent a significant breakthrough in electro-magnetic technology. This state-of-the-art electronic deposit controller provides continuous scale and bio-film control in fluid systems.

### Combined Products for Enhanced Results– Chemical-Free Water Treatment Process Diagram



**TWT All-In-One Water Treatment, component configuration can be upgraded, sized and changed to meet your home, office or factory specific treatment requirements.  
(Filtration, Deposit Control and/or Ultra Violet Technology)**



## Water & Energy Conservation for Future Generations!

TWT Systems are Undeniably Significant From Operational, Economical, and Safety Points-Of-View.



### HARD DOLLARS SAVINGS- Chemicals, Salts Water & Energy

- Usage reductions of around 90% or more are typical.
- **Water In** - typically the HVAC industry concentration ratio can be increased from 2-3 to 6-8 (while still reducing the chemical consumption), indicating an annual make-up water savings of 60% or more. Savings would include conservation incentives.
- **Water Out** - volume of discharged water is reduced proportionately, along with the fees. Depending on actual chemical, salt use reduction and local laws, further savings may be possible if blow down water can be recycled and/or sent directly to the sewer system.



### WATER USES & ENVIRONMENTAL CONCERNs...



**10% INDUSTRIAL**



**21% MUNICIPAL**



**69% Agricultural**



**Polluted Discharge**

#### Problem:

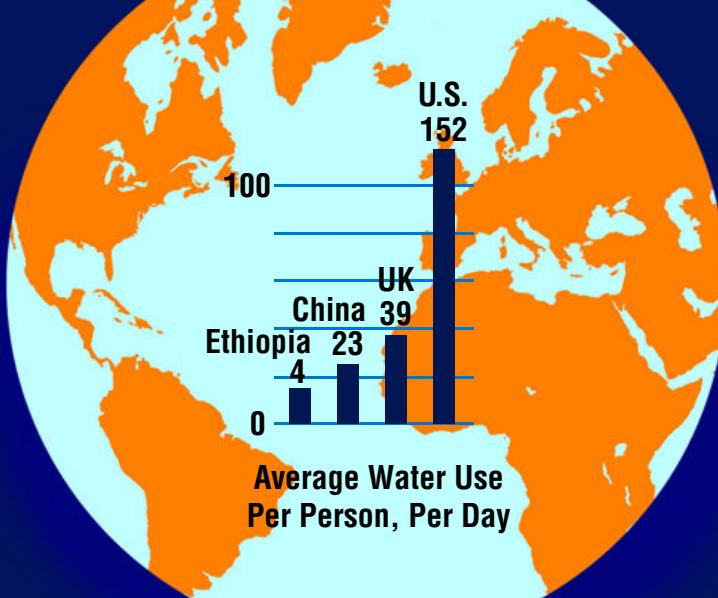
5.3 Billion  
People will suffer from  
water shortages by  
2025

**48**

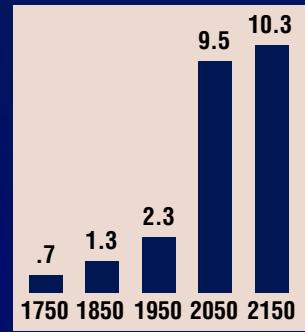
UN estimate of the  
number of nations that  
will face fresh water  
stress or scarcity by  
2025

**80 Million**

Average yearly  
population growth



#### Problem:

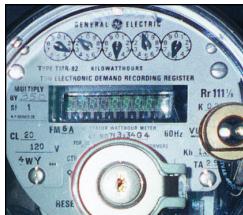


World Population  
Growth in Billions

Source information as written in industry trade publication

# The Return On Investment of a TWT System is Undeniably Significant From Operational, Economical, and Safety Points-Of-View.

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- **Energy** - systems have been found to deliver between 5 and 15 % energy savings when compared to a well functioning chemical system because the controller adapts to changes in water conditions without operator intervention. Energy savings can be much higher (up to 40 %) vs. a poorly performing chemical system or no chemical system at all.

## SOFT DOLLARS - Materials, Labor, Time, Safety

- Chemical, salt handling and storage costs - reduced material and labor costs, freed-up storage space and cost allowance for increased safety (risk reduction). Reduction comparable to chemical cost reduction (up to 90 %).
- Maintenance, repair, replacement and downtime costs (chemical & salt delivery systems) - due to reduced usage rate. Reduction comparable to chemical and salt cost reduction (up to 90 %).
- Maintenance, repair, replacement and downtime costs (plumbing system, tower and cooling systems) - due in part to the adaptability described above under "Energy". Cleaning of the system and/or during shut down is also generally easier with TWT technology, as any film on any surface can be easily removed with a soft cloth. Additionally, the lower level of chemicals in the system will make it safer for workers doing the cleaning (75-90 %).



## LIFECYCLE SAVINGS

- Savings continue typically for 10 years or more from date of installation. Savings accelerate after the payback period and continue for the life of the system. Lifecycle savings are thus typically many times the cost of the TWT System.

## HARD DOLLARS

- Can be estimated from purchase records or water volume and prices from the previous year.

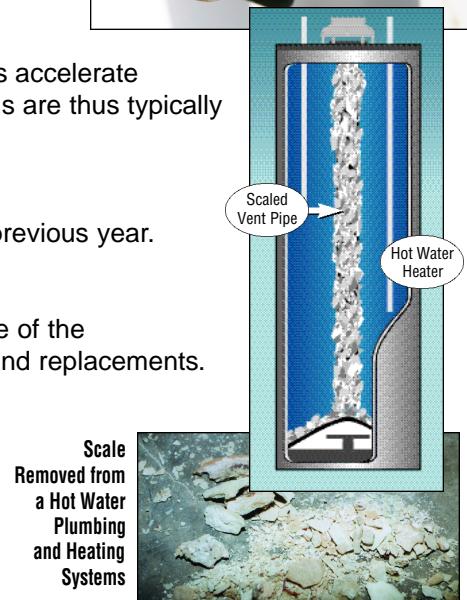
## SOFT DOLLARS

- Costs should be estimated based on the average of 10 years of data, or the age of the system if less than 10 years old, to smooth out the effect of infrequent repairs and replacements.

## LIFECYCLE SAVINGS

- Are calculated as the net present value of the sum of the annual savings over 10 years using a reasonable interest rate (e.g. prime plus 2 %).

**TYPICAL PAYBACK** is less than 2 years when considering **HARD DOLLARS ONLY**.



## TWT: The Ultimate in Chemical-Free Water Treatment & Conditioning

TWT, Inc. offers a full range of products & systems designed to address fluid problems wherever fluid flows. From patented deposit control technology to pre and post filtration needs, ionization, disinfection, and ultraviolet purification treatment and conditioning, TWT has the versatile, efficient, cost-effective methods to solve your fluid management problems end to end.

Triangularwave Technologies, Inc.(TWT)

**Sensing Environmental Needs with Intelligent Solutions**

**Be Smart, Buy Once! Go Green Save Green**

# How to choose the right water treatment system

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## Choosing the right system depends on several things...

TWT offers a full range of products & systems designed to address fluid problems wherever fluid flows. From TWT® patented deposit control technology to pre and post filtration needs, ionization, disinfection, and ultraviolet purification treatment and conditioning.

Components and subsystems chosen from across the range of treatment methods can be combined in different configurations to provide custom solutions specific to your facility site or application. TWT® has the versatile, efficient, cost-effective methods to solve your water/ fluid management problems end to end.

Triangularwave Technologies, Inc. products and systems provide technologically advanced methods for water and fluid management that are both efficient and cost-effective.

Components and subsystems chosen from across the range of treatment methods can be combined in different configurations to provide custom solutions specific to any site or application. Each product line offers a variety of both standalone and comprehensive treatment solutions for end-to-end fluid management, for all types of applications.

At TWT, Inc. we feel the simplest way to choose a system depends on your personal situation. Home/office owners with well water have different water treatment requirements than users who rent an apartment in a city. People with municipal water may choose to rely on a scaled down system that meets their current needs, while people drinking untreated ground or surface water need to fully account for all aspects of water treatment in order to guarantee the purity if their water.

## To ensure the greatest level of satisfaction in your work with the TWT, Inc. Water Treatment Products & Systems:

Know the performance capabilities and technical limitations of all products and systems to guarantee the proper installation application and treatment solutions.

Manage Expectations: Verify the purchase order product/system application, installation and performance needs.

## Take these steps before placing your purchase order:

1. Verify the pipes/tubes to be treated in your systems, i.e., diameter of pipe or Tube (1", 2", 3",etc.) pipe material – copper, PVC, steel, ductile iron, glass, rubber, etc.
2. Verify that you have chosen the correct location and application method, i.e., determine reaction zones, onsite solenoid wrap, Copper Pipe Signal Enhancer, Reaction Chamber, etc.



3. Verify that you have determined the appropriate Deposit Controller based on water quality review, system to be treated (process review); check your installation & technical guidelines on TWT websites for additional information.
4. If any upgrades/ changes are requested, it must be noted on your purchase order, e.g., voltage source changes (110/240 etc.), Deposit Controller upgrades and reason for upgrade additional wire & type of wire (Teflon, etc.), Reaction Chamber construction material e.g., Schedule 40/80 PVC, etc.
5. When using TWT Deposit Control Systems in conjunction with or integrated within other TWT or non TWT treatment technologies and systems, be certain to verify the performance capabilities and technical limitations of all system components.

## TWT, Inc. Filtration, Ultraviolet, Pool Systems and Integrated Systems:

1. Before purchasing TWT filtration, ultraviolet, Pool & Spa systems and/or TWT integrated systems, be certain to verify the specific application, installation and performance capabilities of these products and systems.
- The levels of chemical-biological contaminant's found in your personal water source (municipal or well water) as revealed in an independent water quality test. Know what's in your water!
- The water treatment requirements dictated by the base water quality and environmental factors found in your geographic area.
- The optimum amount of water measured in gallons per minute (GPM) necessary to satisfy your peak usage. Facilities with wells call your installer for GPM information.
2. TWT, Inc. recommends that all filtration, ultraviolet and TWT integrated systems, be sold and/or purchased with an initial supply of replacement products e.g., replacement filters, UV lamps etc. This will insure uninterrupted service and treatment.

E-mail your distributor and/or TWT, Inc. customer service department if required to verify your product selection.  
info@triangularwave.com

**Visit Triangularwave Technologies, Inc.'s comprehensive websites, the valuable technical resource for all involved in water and fluid management...www.triangularwave.com  
www.twtwatertreatment.com**



**Lots Of Companies Provide Products And Systems...TWT, Inc.  
Senses Environmental Needs With Intelligent Solutions  
At Home Or In The Office...  
The Difference in Technology Matters!**

See these technologically advanced products, systems and treatment methods for yourself—  
Visit [www.triangularwave.com](http://www.triangularwave.com)  
[www.twtwatertreatment.com](http://www.twtwatertreatment.com)



**TWT The Environmentally Friendly  
“Green Market” Solution!**

**Don't Wait...**Contact us today for a free consultation! A luxury you can afford. And for information on what TWT system will meet your specific application needs.

**Value Added Technology**

TWT makes sense from an operational, economical and safety point-of-view.

Thank you, The team at TWT, Inc.

**No Matter How Tough The Job...TWT® Has The Solution**

**TWT® The Ultimate in Chemical-Free Water Treatment & Conditioning**

**The green way**

