3 Grades of Water

Raw Water

Working Water

Drinking Water

There are three grades of water in your home. The raw water is used outside for things like irrigation and pressure washing. The working water is the water you use for laundry, dishes, bathing cleaning, and so on.
The drinking water needs to be the highest quality.

The first test I'll conduct will focus on your working water. I'll be testing for contaminants that are larger and more obvious throughout the home.

Precipitation Test

This test will visually compare your tap water with the water run through the mini-conditioner.

10 drops Potassium Hydroxide to coagulate hardness minerals.

10 drops of a yellow die, Hydroxyquinolinol Sulfate, to provide some background color.

Precipitation Test – The chemical reagents in this demonstration pull the Calcium and Magnesium [major contributors to hard water] ions out of solution to form a cloudy precipitate in hard water. This enables the viewer to see the precipitated hardness minerals in the water. The water that has been run through the ion exchange resin has had these ions removed, therefore the sample should remain clear [with yellow die color]. **THE MINERALS SEEN IN THE HARD WATER DO NOT INDICATE THAT THE WATER IS UNSAFE TO CONSUME.**

Hardness Test

This test is called a hardness test. We'll test side by side samples again, one from your tap and one treated by the mini-conditioner.

3 drops of buffering agent - hardness #1

3 drops of hardness solution #2 (If the water turns blue it's soft, if it turns red, it's hard)

Third reagent is a liquid softener. Each drop represents one grain per gallon of dissolved minerals / sediment.

Soft Hard

Total Hardness Test – Total Hardness of a water supply generally represents the total concentration of Calcium and Magnesium ions expressed as Calcium Carbonate (CaCO3). Other ions may contribute; however, they are usually present in insignificant quantities. The quantity is reported in grains per gallon which is a measurement of weight. 7000 grains is equal to 1 pound of hardness. This test estimates the measurable hardness of your home's water.

How hard is your water?

Refined Water	→	Less than 1 GPG
Moderately Hard Water	→	1 - 3.5 GPG
Hard Water	→	3.5 - 7 GPG
Very Hard Water	→	7 - 10.5 GPG
Extremely Hard Water	→	10.5 or more GPG

Source: Water Quality Association

Water Quality ASSOCIATION®

What is Hard Water?

This 50-pound rock in a sink helps illustrate the problem. Grains Per Gallon is a measurement of weight of dissolved rock in your water. The harder your water tests in grains per gallon, the more dissolved rock or mineral is entering your home.

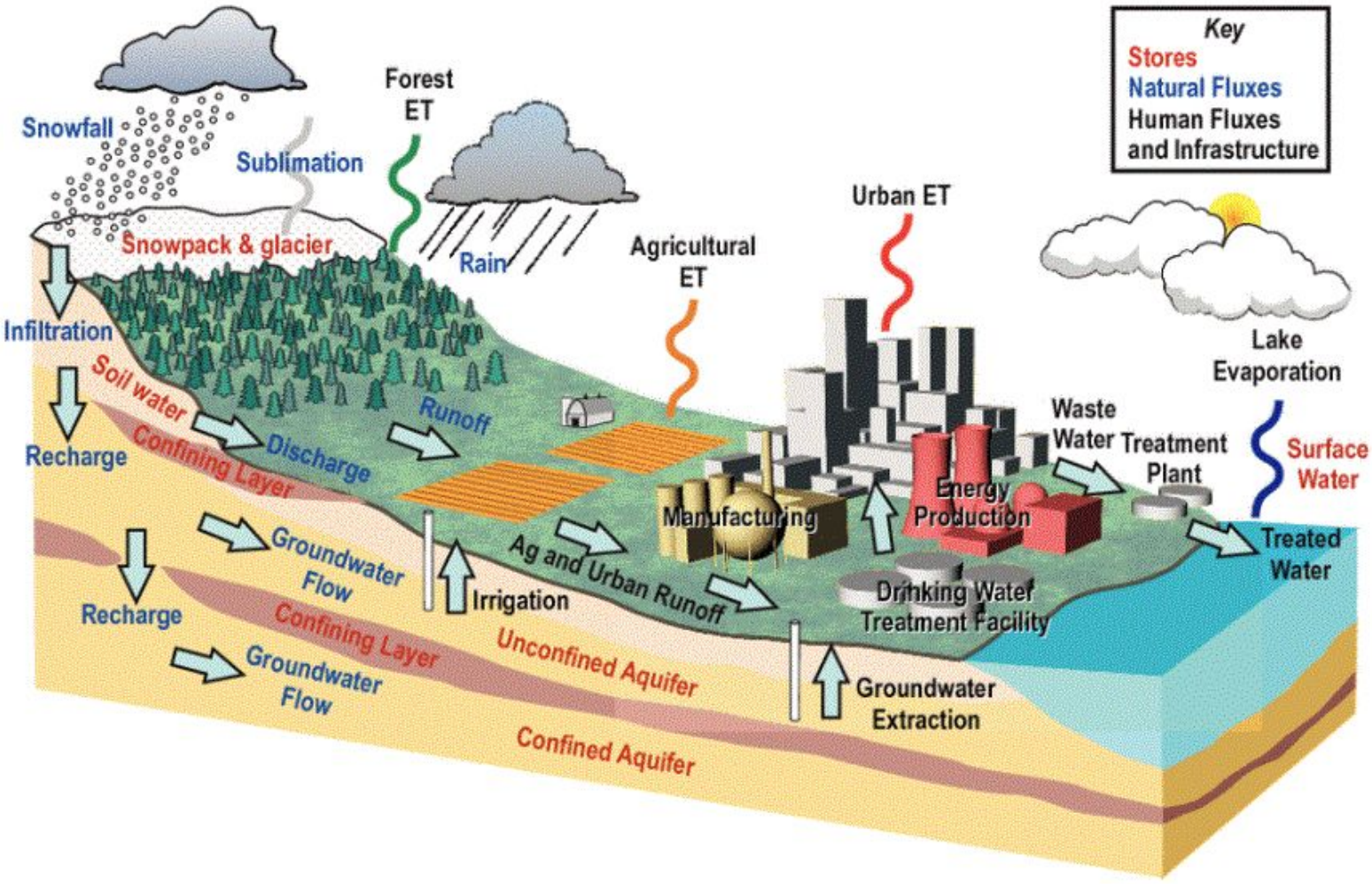
How much rock is coming into your home?

	5	gr/gal
x	72,000	gal/yr
	360,000	gr/yr
÷	7,000	gr/lb
	51	**lbs/yr**

51 pounds of rock per year!

If we go back to the Precipitation Test now, you'll see what this looks like in your water. This test precipitates the hardness minerals out of solution so you can easily see them.

Hydrologic Cycle



Carbon Monoxide | **Pesticides** | **Nitrates** | **Herbicides** | **Dissolved Rock** | **Lead** | **Strontium Arsenic** | **Fungicides** | **Bacteria** | **Industrial Chemicals** | **Phosphates** | **Chromium**

Water is the universal solvent: it dissolves a little bit of everything it contacts. As it rains and falls to the ground it contacts both natural and man-made contaminants. Some surface water runs off into rivers and lakes while some penetrates the ground where it contacts more subsurface contaminants, picking up a little bit of everything along the way. The water department then draws water from either underground and/or surface sources. Once they treat the water to a certain point, one of the last things they do is add chlorine or chloramine, which is a combination of chlorine and ammonia, to disinfect and eradicate any waterborne bacteria while also bleaching the water to remove any color.

Chlorine Test

Next, we'll test for chlorine. I'm going to put some of your working water in this vial and put 5 drops of OTO, the same chemical used to test for chlorine in swimming pools. If it turns yellow, chlorine is present. This test takes a few minutes to render an accurate reading.

While we wait, let's read the following definitions…

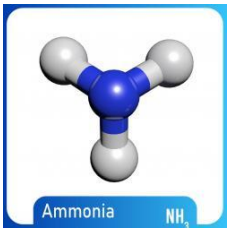
Chlorine Test – The orthototolidine (OTO) is an indicator solution that will measure the amount of residual chlorine in the water. Within a few seconds of the OTO solution being added to the water, you will see the results. Compare the resulting color to the scale to estimate the amount of free chlorine in the water. Wait 1 to 2 minutes and compare colors to estimate combined chlorine reading. Most pool water test kits will indicate the ideal chlorine range for a swimming pool between 1 and 1.5 parts per million.

Definitions

Definitions obtained from Dictionary.com

Chlorine … greenish-yellow incombustible, water-soluble, poisonous gas that is highly irritating to the respiratory organs…used widely to purify water, as a disinfectant and bleaching agent.

Ammonia – A colorless, pungent, suffocating, highly water-soluble, gaseous compound usually produced by the direct combination of nitrogen and hydrogen gases: used chiefly for refrigeration and in the manufacturing of commercial chemicals.



These chemicals are very effective at killing living organisms in the water, but once it's ready for use in your home, it's best if it's removed, right? Let's go back to the Chlorine Test to see how much chlorine is entering your home.

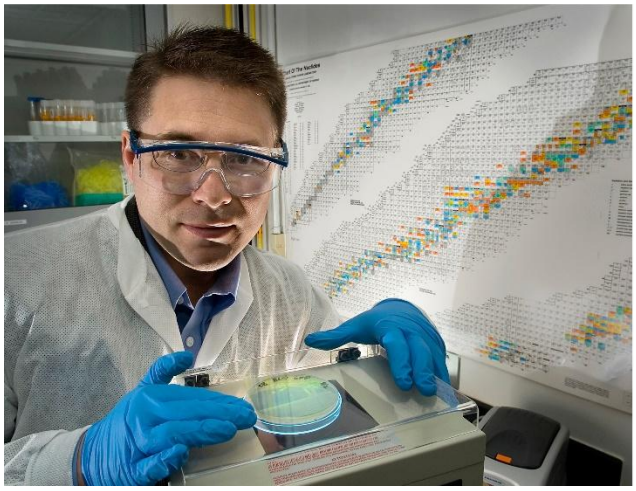
Hard Water Problems

Eventually these impurities will damage or clog anything they pass through or come in contact with. They will restrict or even stop the flow of water in your plumbing over time.

BATTELLE

It can be done

Softened Water Benefits Study



The Water Quality Association commissioned a study on the effects hard water has on our appliances. The research was conducted by Battelle, a 75-year-old premier scientific laboratory in Columbus, Ohio.

The study tested devices using hard and soft water under controlled laboratory conditions, specifically focusing on the effects of the efficiency and performance of water using appliances, faucets, and fixtures.

BATTELLE
It can be done

Water Heaters – The Test


Gas Storage &
Instant Water Heaters

Like we've done here, Battelle did side by side testing comparing the outcomes.


Electric Storage
Water Heaters

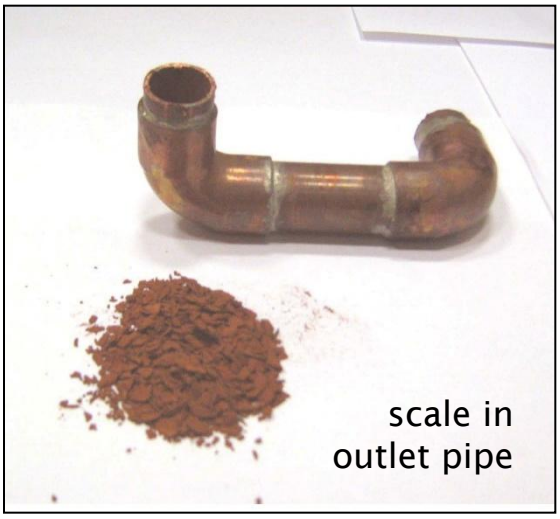
They set up and tested ten gas, ten electric, and ten instantaneous water heaters, five of each on hard water and soft water.

BATTELLE
It can be done

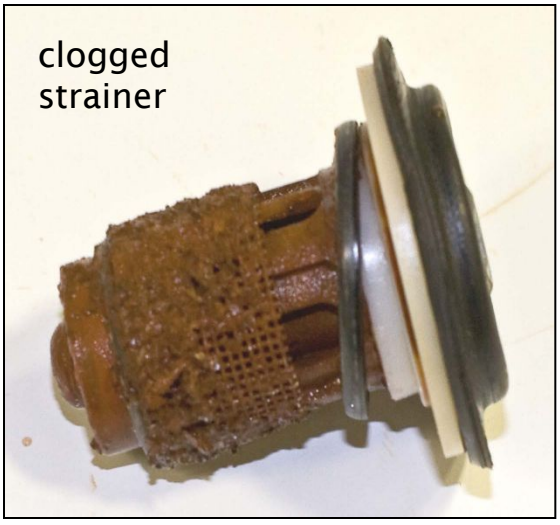
Instantaneous Water Heaters – The Results

The instantaneous water heaters fared the worst.

Two heaters stopped working as a result of insufficient flow after 1.6 years of equivalent use. The third made it 2.3 years and the last two made it to 2.5 years.


scale in outlet pipe

The heating elements in instantaneous heaters are triggered to turn on based on water flow. When the flow rate gets restricted too much, it won't turn on and heat the water, rendering them useless.

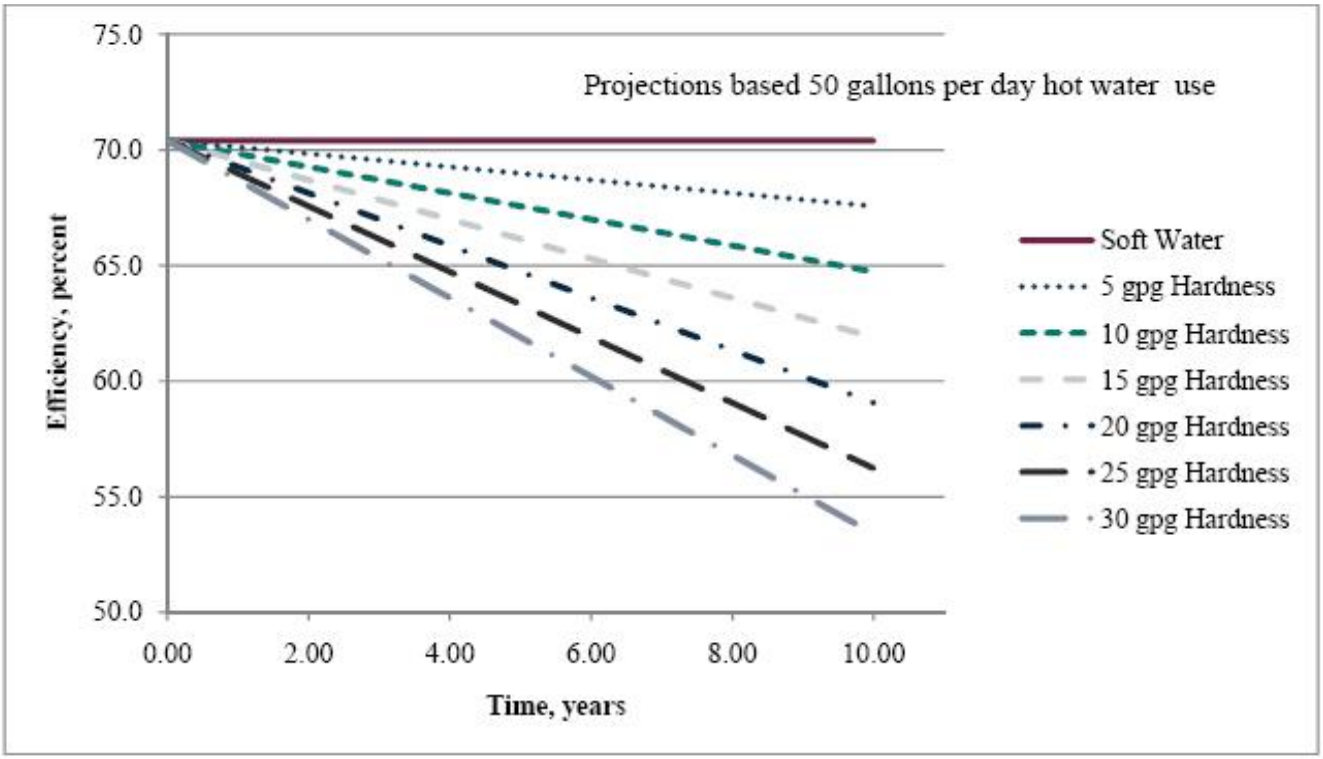

clogged strainer

BATTELLE
It can be done

Gas Storage Water Heaters – The Results

The top line shows that the heater maintains its efficiency on soft, treated water while it degrades continually, on hard water.

They concluded that the gas water heater on the hard water sample would be 48% less efficient than the soft water sample if the family uses 100 gallons of hot water per day.



BATTELLE

It can be done

Teardown Analysis:

After 90 days of accelerated testing equivalent to 2.25 years of field service.

GAS WATER HEATERS

ELECTRIC WATER HEATERS

Tested Using Hard Water

Tested Using Soft Water

BATTELLE
It can be done

Dishwashers – The Test / Results

The dishwashers completed a total of 240 cycles over a 30-day period.

Hard Water Results

Soft Water Results

BATTELLE
It can be done

Laundry Washers – The Test / Results

The washers completed a total of 240 cycles over a 30-day period.

The teardown analysis of internal components revealed that the spray nozzles on the washers using soft water were completely open; however, the nozzles on the washers using hard water were partially clogged.

Tested Using Soft Water

Tested Using Hard Water

BATTELLE
It can be done

Shower Heads and Faucets – Results

The fixtures using hard water clogged in less than seven days of accelerated life testing, whereas those units using softened water made it through the test without any problems.

In the Home

These hard water contaminants not only build up in your plumbing, appliances, and fixtures, they also build up all over other surfaces in your home. You can eliminate these problems with treated water. Let me show you an example. Here in your sink, I'm going to make a small bubble bath.

Skin and Hair

When bathing in untreated water, the same thing happens. Soap curd is left behind on your skin and hair, unable to dissolve completely and rinse away. Chlorinated water also strips the skin and hair of its natural proteins. Hair can get rough and brittle, lose its color and shine, and become difficult to style and manage.

Hard Untreated

Soft Treated

Billions of dollars in body washes, soaps, conditioners, body oils, and lotions are purchased every year to combat these common problems, when all along, the problem has been your water.

Do you ever see spots on your glasses, dishes or flatware?

How Hard Water Affects your Laundry

I'll need to borrow a clean, freshly laundered hand towel, and a small bowl. While you get that, I'll get the last two samples of water.

I'll wash your bowl with treated water to make sure it's good and clean, then I'll place your towel in it with just enough treated water to saturate it.
(Set aside for a few minutes)

Washing Machine Demonstration

While that towel soaks, let's pretend we're doing two loads of laundry. I'll place drops of this liquid soap in each sample. This is pure liquid soap with no additives or softening agents of any kind. I'll start by putting two drops in each sample. Let's put the caps on them and shake them up to get some suds.

Washing Machine Demonstration – Water hardness challenges are demonstrated by comparing how hard water reacts with pure liquid soap. This pure liquid soap has no softening agents or chemical additives of any kind. It is not utilized in this demonstration as a comparison to the customers store bought soaps. It merely demonstrates how poorly hard water performs with pure soap without additional softeners added.

Soap Rinse

When your laundry washer finishes the wash cycle, what comes next?

It empties the washer of all the soap-laden water and attempts to rinse the laundry with this same tap water loaded up with all these hardness minerals. How well do you think that's going to work?

Residual Soap

Let's take this small hand towel that's been soaking in my treated water and wring it out to see what we find.

I'm going to dump the water out of my soft water flask and rinse it clean with my treated water, and then pour the water from your hand towel into it and shake it up.

What do you notice?

PURDUE
UNIVERSITY™

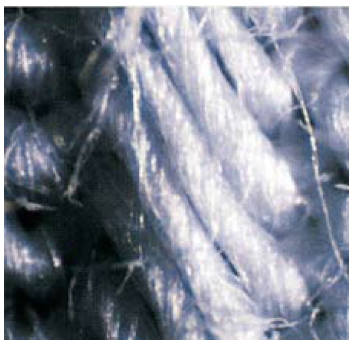
Benefits of Using Soft vs. Hard Water in Laundering Operations

Further studies have been on on this. Over 18 months, using four different fabrics and three detergents, researchers discovered:

1. The life of clothing and household textiles was prolonged up to 15% when washed in soft water.
2. Hard water washing did not remove soil as well and clothing was re-soiled more quickly.
3. Greater amounts of detergent were needed.
4. The greater the deposits (hardness minerals) the greater the deterioration of the fabric.

Cotton washed in unconditioned water

Cotton washed in conditioned water



Water Quality Association

According to the Water Quality Association report entitled *Estimated Annual Savings from Water Softening* the following soap savings can be realized when using soft water vs. hard water.

Total GPG (grains per gallon)	**Savings Percentage**
5	27%
10	42%
15	52%
20	59%
25	64%
30	68%

Drinking Water

Total Dissolved Solids (TDS) Tester

Up to this point, we've only tested and discussed your working water. What you are seeing in the precipitation bottle is just the dissolved hardness components and not the multitude of chemicals and other dissolved solids that may still be present. Now, we are going to start testing your drinking water.

I'll use a TDS meter to get immediate results, of the Total Dissolved Solids, not just the hardness minerals in the water. Results are shown in parts per million (ppm).

Test: Tap Water | Bottled Water | Filtered Water

TDS Meter Test – A TDS meter detects the amount of Total Dissolved Solids in a solution. The meters are factory calibrated for accuracy and can be recalibrated as needed. Water temperature can affect the accuracy of a TDS meter. Most modern meters have a built-in temperature compensation feature to adjust for water temperature. The meter reports the results in parts per million (ppm). Average accuracy is +/- 3%.

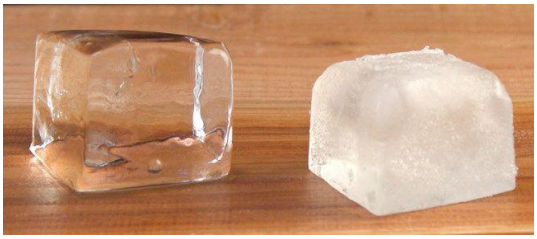
Consumption Water

Do you drink coffee, tea or any mixed or powdered drinks like Crystal Light, Propel, or Mio? Do you use tap water or bottled water to make these beverages?

The contaminants and chemicals in your water require you to use more of these mixes to overcome the bad water taste.

Tap water not only ruins the taste of your drinks, but it also ruins the quality of your pasta, rice, potatoes, and vegetables. Foods cooked in treated water will look better, taste better, and be better for you.

Do you have an icemaker? Let me show you something you may have never thought about.



The Westinghouse Solution

We start with a Westinghouse refiner that connects to your main water line and treats all the water entering your home, similar to how the mini filter did during the side-by-side testing.

The Westinghouse refiner is designed to do the heavy lifting, removing the objectionable dissolved hardness minerals and reducing the chlorine and heavy metals as water enters the home.

It will provide an unlimited supply of treated working water. It's fully automatic, highly efficient, and computer controlled.

UPC ®

Certified by
International Association of Plumbing and Mechanical Officials (IAPMO)
R&T to NSF/ANSI 42, 44, 61 & 372 · IPC · IRC

Westinghouse

How it Works

1

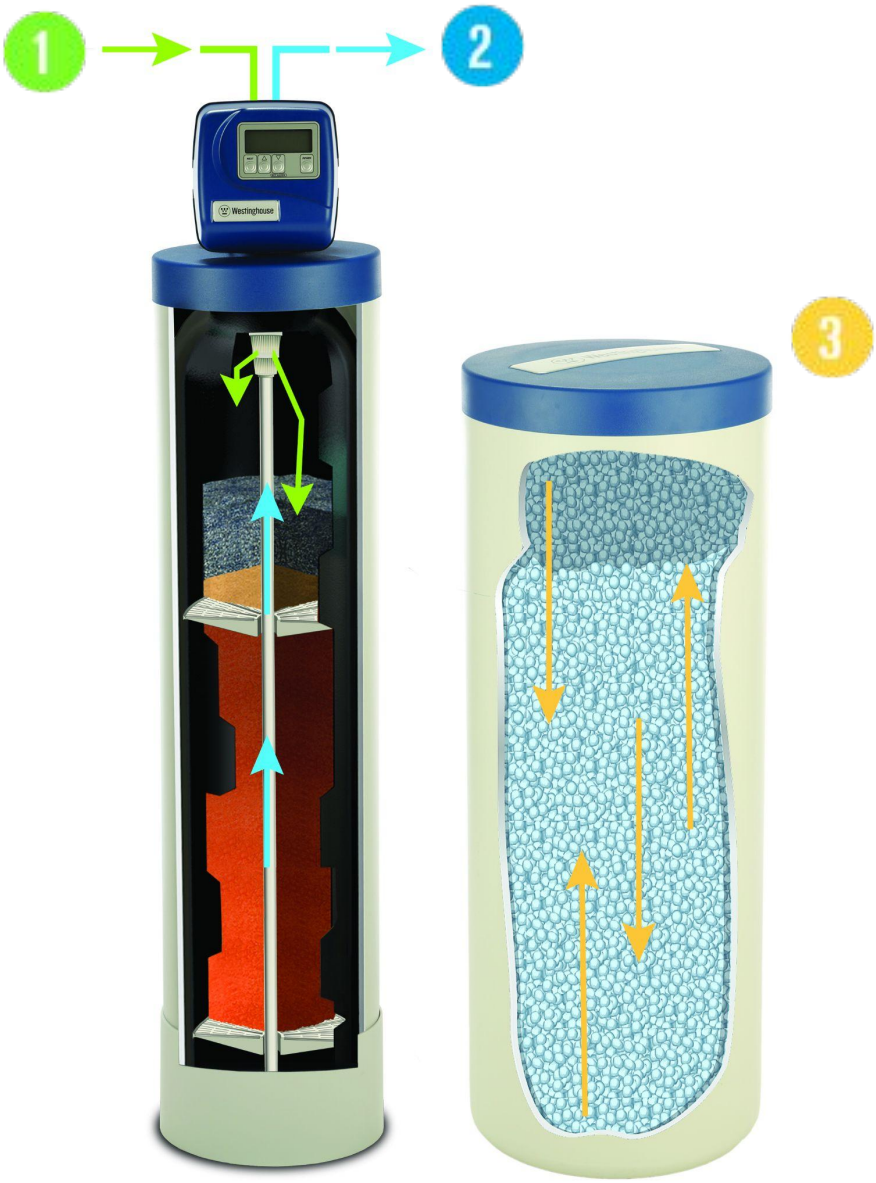
Untreated water enters the mineral tank, which contains a proprietary blend of filtering medias that act like a magnet, attracting the undesirable contaminants to its surface and separating the contaminants from the water.

2

Then, the clean, treated water flows back up the riser tube to be distributed throughout your home.

3

Treated water from the brine tank recharges the filtering medias inside the media tank so your Westinghouse Refiner can stay ready to treat your water 24 hours a day, 7 days a week, 365 days a year.



Westinghouse

Drinking Water System

The Westinghouse Drinking Water System incorporates a multi-stage filtration process. It is installed under your kitchen sink and the high purity water it produces is dispensed through a dedicated designer faucet that will be installed next to your existing faucet.

The Westinghouse Drinking Water System has been tested and certified by NSF International and boasts some lofty performance standards, capable of removing up to 95% of the remaining contaminants in the water. The Westinghouse Drinking Water System provides high purity water that can only be attained through advanced filtration.

The system is also fully automatic and has a membrane production rate of up to 50 gallons per day.

NSF is a registered trademark of NSF International. The Westinghouse Drinking Water System D-550 is tested & certified by NSF International to NSF/ANSI-Standard 58 for the performance claims listed on the performance data sheet (PDS).

Westinghouse

Westinghouse Dependability

The Westinghouse Drinking Water System utilizes best-in-class design to ensure unsurpassed dependability.

Westinghouse developed a unique manifold that internally channels water from one filtration stage to the next, eliminating up to 10 external fittings, connections points, and tubing found on inferior designs from other manufacturers.

Cross section of one-piece manifold

The filter modules are all-in-one components made up of a precision molded, high-strength housing, a hermetically sealed filter that is sonic-welded to the housing and a new chlorine resistant amorphous O-ring that ensures a long-lasting watertight seal.

P-550 Drinking Water System

Integrated Automatic Shut Off

In-Line GAC

GAC
Sanitary Exchange Module

Membrane
Sanitary Exchange Module

Sediment and Carbon Block
Sanitary Exchange Modules

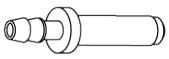
INDEPENDENTLY NSF CERTIFIED

One-Piece
Manifold

STAGE 5
In-Line Post GAC

Integrated Automatic
Shut-Off

Integrated Flow Restrictor



STAGE 4
GAC
Sanitary Exchange Module

STAGE 3
Membrane
Sanitary Exchange Module

STAGE 2
Carbon Block
Sanitary Exchange Module

STAGE 1
Sediment
Sanitary
Exchange
Module

Lifetime Warranty

WESTINGHOUSE WATER TREATMENT SYSTEMS

Westinghouse

LIFETIME LIMITED WARRANTY

The LeverEdge (hereinafter LE) warrants any Westinghouse brand water treatment system manufactured by LE and installed by a duly authorized Westinghouse dealer, to be free from defects in materials and workmanship to the original residential purchaser (hereinafter CONSUMER) from the date of purchase. All aspects of this warranty are subject to the following limitations, terms and conditions.

1. DURATION OF WARRANTY

If LE equipment consisting of the Mineral and Storage Tanks, Controls and Valves, Pumps and Switches, Ion Exchange Resin and Treatment Media, Drinking Water Systems (excluding replacement exchange modules or inline filters) and Ultraviolet Lights (excluding bulbs and sleeves) is determined to have failed as a result of a manufacturing defect, LE will, at its sole discretion, repair or replace the defective part at NO CHARGE to the CONSUMER (excluding labor, and applicable shipping and handling costs) for the duration of the CONSUMER's ownership of the original equipment (hereinafter "LIFETIME").

2. LIMITATIONS OF COVERAGE

This warranty extends only to the CONSUMER for damage resulting from defects in materials and workmanship, and does not include renewable components. It does not extend to damage caused by the CONSUMER'S neglect or abuse, or by accident, to damage caused by wind, hail or abnormal weather conditions, or to damage caused by acts of God, civil insurrection or extraordinary circumstances beyond the control of LE.

LE shall not be liable for any direct or indirect damage resulting from the use of the equipment, and in no event shall the extent of this warranty coverage exceed the purchase price of the equipment.

LE cannot know the characteristics of a CONSUMER'S water supply or the purpose for which one is purchasing LE equipment. Also, water qualities vary seasonally and over time. Therefore, LE assumes no liability for the determination of the proper equipment necessary to meet a CONSUMER'S requirements, nor does it authorize others to assume such obligations on its behalf.

This warranty excludes any equipment which was not manufactured by LE and installed by an authorized Westinghouse dealer or on which the date code has been removed or altered. Any tampering or attempted repair performed by anyone other than an authorized dealer, including the CONSUMER, voids this warranty.

3. MISCELLANEOUS

In order to be considered for validation, all claims for warranty coverage must be accompanied by a copy of the purchase agreement indicating the date of initial installation, and a copy of the CONSUMER's current utility bill. LE reserves the right to inspect the LE Equipment prior to honoring any warranty claim.

This warranty is only issued by LE, and the CONSUMER is hereby advised that Westinghouse Electric Corporation is not the manufacturer of the equipment, and provides no additional or separate warranty whatsoever in connection with the equipment.

This warranty gives you specific legal rights, and you may have other rights which may vary from state to state. Any and all inquiries or claims under this warranty must be submitted in writing to The LeverEdge, Attn: Warranty Department, 1423 Gunn Highway, Odessa, FL 33556.

THE LEVEREDGE
1423 Gunn Highway
Odessa, FL 33556
Phone: (800) 763-8363
www.theleveredge.com

Westinghouse Progressive Revolution Advanced Features

Full Color Controller Displays
- Scrolls **Westinghouse 269** when system is in service
- **Check Salt** displays when low salt level is detected in brine tank.
- **Call Dealer for Service**, if system needs servicing.
- **Faucet drip graphic** indicates refined water in use.

Unique 7-Step Cleaning Sequence
- A low electric current is sent through two built-in titanium plates which cause a molecular reaction, creating a special cleansing solution. This decontamination solution effectively inhibits bacteria growth within the media bed.

Check Salt displays when low salt level is detected.

Proportional Brining Regeneration
- Uses only the amount of brine solution needed to regenerate the depleted portion of the media's capacity.

Variable Reserve Function
- Saves salt and water, regenerating only when needed.
- Reviews four weeks water usage by day, determines if it has capacity for the next day's average usage. If not, it regenerates that evening proportionally to the capacity that's depleted.

Dry brine tank
- Fills with refined water before regeneration
- Brine tank stays cleaner
- Prevents salt bridging

NOVRAM
- **Non-volatile Ram Memory** stores critical program settings indefinitely if power is lost.

Backup Capacitor
- Saves time of day and water usage history for up to 7 hours if power is lost.

Upflow Regeneration
- Most efficient process, delivering full strength brine solution to most depleted media first.