



SOFTENING VS CONDITIONING

Understanding the differences in technology.

Problems with Hard Water

- Disadvantages of Hard Water
- Detergents are not as effective at cleaning.
- Washing clothes and dishes require more detergents
- Scale buildup degrades water heater efficiency over time
- Overall appliance life is decreased
- More cleaning products are required to clean s
- Dry and damaged hair and skin
- Unsightly film on glass dishes
- Clothes colors fade faster and whites become dingy
- Scum, streaks, spots ruin faucets and fixtures

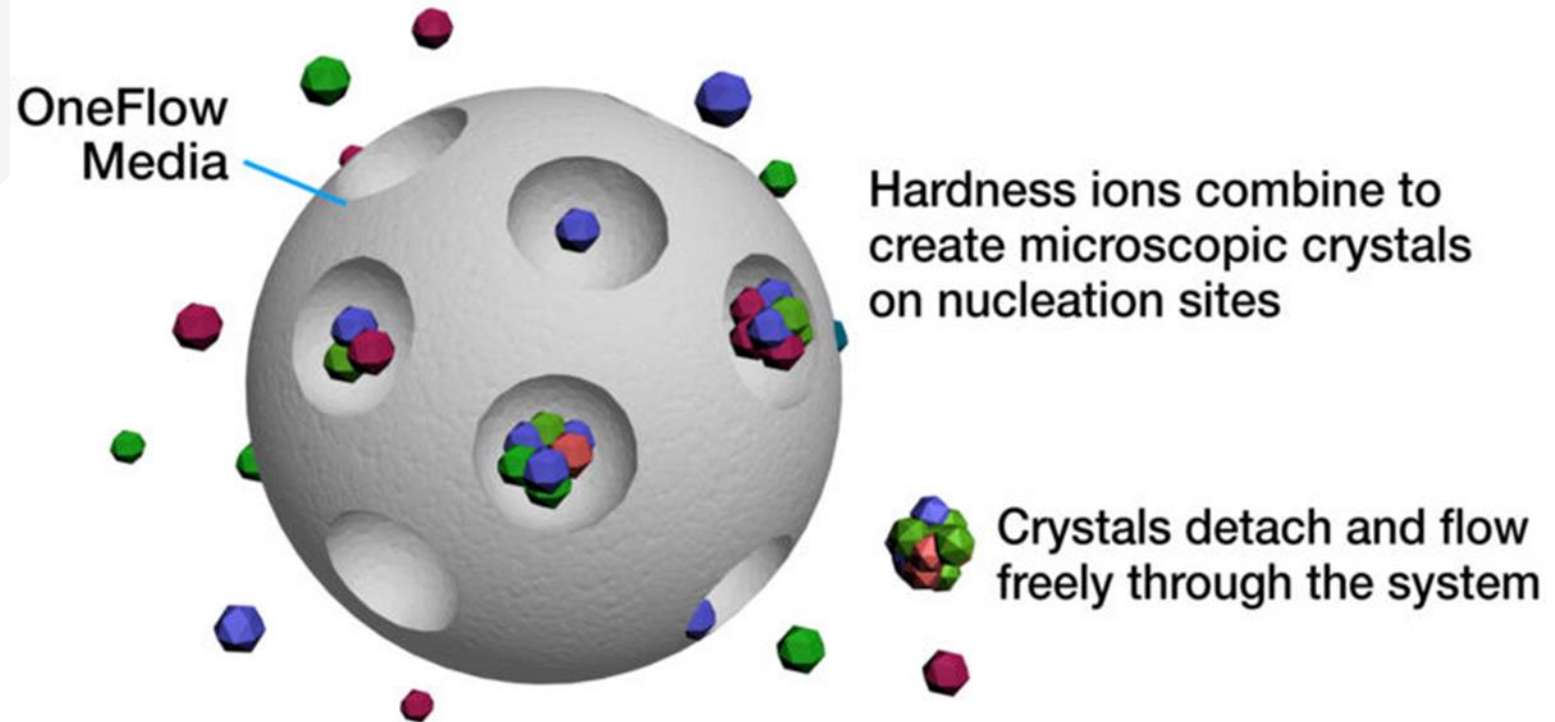
Will a Technology Resolve These Issues?

How Salt Free Conditioners Work

- Only works on calcium and magnesium
- The medias used are TAC and NAC
- TAC = Template Assisted Crystallization
- NAC = Nucleation Assisted Crystallization
- Both medias promote the formation of aragonite crystals , an insoluble form of calcium carbonate and its magnesium analog
- Mineral content still present but none reactive. 90% effective.
- Mineral content is not removed from water but converted to micro crystal forms meant to pass through equipment.
- Requires Special detergents to work properly.

Conditioners Convert Dissolved Hardness into Insoluble Versions of Scale Deposits

Concept Behind TAC and NAC



Creates a Surface that is More Preferable to Form Scale Crystals Upon

Benefits of Salt Free Conditioning

- Maintenance-free
- Prevents scale INSIDE the plumbing
- Very easy to install
- Provide the best quality healthy water without the addition of Sodium or Phosphates
- Carbon Neutral*
- Eco - Friendly
- The perfect water softener alternative for people who do not like the slippery feel of soft water
- No waste water after start up
- One media used no options

Removes Existing Scale in Plumbing

Deficiencies of Salt Free Conditioning

- Converts hardness to insoluble particulate; the higher the hardness the more abrasive the water
- Contaminates not removed
- Particulate will build up in vessels and need to be flushed out, water heaters, boilers, coffee brewers, ice makers, tubs, sinks and in showers
- Only works on hardness; does not soften water
- Must have adequate sanitation prior to units
- Clear non turbid water less than 5 ntus
- 10 min rinse minimum or 60 min soak followed by ½ gpm for 60 min then flush at 5 gpm for 30 gallons
- Must wait on new construction for 6 weeks of water use on copper plumbing
- No copper in water
- No oils in water (organics)
- No Hydrogen Sulfide in water
- Media life 3-5 years
- Clogged aerators from use on existing plumbing
- Less than 0.3ppm of Iron
- Less than 0.05 ppm of Manganese
- Proper electrical grounding and bonding critical to success
- Need to use special soaps
- Water spots still visible
- Hard water deposits replaced with spotting
- Residue from water needs to be wiped down
- Must have a sediment pre-filter
- No backwash to remove debris
- Increased wear and tear on water using equipment from abrasive water
- Fluidized bed is less efficient than packed column; built in channeling

Important Boxes to Check to Ensure Success

Advantages of Soft Water

- Advantages of soft water
- Actually removes contaminants not converting them.
- Detergents are up to 12X more effective for cleaning
- Use up to 70% less dish soap and clothing detergents
- No scale buildup and water heater efficiency is maintained
- Overall appliance life is maintained
- Less cleaning products required
- Moisturized and healthier skin and hair
- Cleaner, spot-free glass dishes
- Cleaner clothes and whiter whites
- Preserves the look of faucets and fixtures

Works with the Technology in a Home without Special Needs

Benefits of Softener

- Contaminates actually replaced in water
- Works on more than just hardness
- Requires less pretreatment
- Works day one, no waiting for install up to 6 weeks
- No clogged aerators
- Works on 99% of waters
- Backwashable
- Upflow and downflow
- Measurable results (no hardness, no metals just sodium)
- No residue buildup in equipment
- No abrasives being created in the water.
- Versatile and adaptable to onsite water conditions via programing, media choices, and regenerates
- Many media options to improve efficiency

Versatile Tool to Manage all Water Qualities

Compare and Contrast

Softener

- Pretreatment optional
- Well and municipal waters
- Removes iron and manganese
- No scale build up
- No abrasives in water
- Install on any plumbing no wait
- Media life 10-15 years
- Contaminates discharged from unit
- “any water product”
- Repairable valve
- Water use during regen
- Standard in the industry both residential and commercial
- Eliminates issues with problem water
- Environmentally friendly products from an energy perspective.

Conditioner

- Pretreatment required
- Municipal waters only
- Iron and manganese removed prior to unit
- Scale may build up on surfaces and in equipment as a powder
- Abrasive aragonite crystals in water stream
- Must delay installs for 6 weeks on new copper construction
- Media life 3-5 years
- Only hardness is managed
- “Easy water product”
- Media is expensive 3 to 5 x resin cost at 2-3 x replacement rate of resin
- No waste stream (where are the contaminants going)
- Will not improve product quality in many products
- Particulate will foul RO membranes. Antiscalant will not work
- New kid on the block
- Changes issues but does not eliminate issues
- Sells on emotional value statements of being environmentally friendly.

Two Very Different Water Management Tools

Media Replacement Costs

Media Replacement Costs cadence **5 years**

- 8x35 tank 3L = \$385 + tax + 2hr labor
- 9x48 tank 4L = \$512 + tax + 2hr labor
- 10x54 tank 5L = \$640 + tax + 2hr labor
- 12x52 tank 7.5L = \$960 + tax + 2hr labor
- 14 x 65 tank 12.5L = \$1536 + tax + 2hr labor
- 16 x 65 tank 19.0L = \$2432 + tax + 2hr labor

Ten year comparison

- 8x35 tank = \$770 + \$272 = **\$1042 + 2 x Tax**
- 9x48 tank = \$1024 + \$272 = **\$1296 + 2 x Tax**
- 10 x 54 tank = \$1280 + \$272 = **\$1552 + 2 x Tax**
- 12 x 52 Tank = \$1920 + \$408 = **\$2328 + 2 x Tax**
- 14 x 65 tank = \$3072 + \$408 = **\$3480 + 2 x Tax**
- 16 x 65 tank = \$4864 + \$544 = **\$5408 + 2 x Tax**

Numbers do not include plumbing costs to replumb

Media Replacement Costs Cadence **10-15 years**

- 8x35 Tank .64cuft = \$64 + tax + labor
- 9x48 Tank 1cuft = \$100 + tax + labor
- 10x54 Tank 1.5cuft = \$150 + tax + labor
- 12x52 Tank 2.0cuft = \$200 + tax + labor
- 14x65 Tank 3cuft = \$300 + tax + labor
- 16x65 Tank 4cuft = \$400 + tax + labor

Ten Year comparison

- 8x35 tank = (\$64 + \$136) + Tax = **\$200 + tax**
- 9x48 tank = \$100 + \$136 = **\$236 + tax**
- 10x54 tank = \$150 + 136 = **\$286 + tax**
- 12 x 54 tank = \$200 + \$204 = **\$404 + Tax**
- 14 x 65 tank = \$300 + \$204 = **\$504 + tax**
- 16 x 65 tank = \$400 + \$272 = **\$672 + tax.**

Numbers do not include plumbing costs to replumb

In 15 years 3-5 salt-less re-beds, 1-1.5 re-beds. TAC and NAC > \$ Cation Resin

Conclusions

- Salt free conditioners requires robust pretreatment in order to function well
- Trace iron, manganese, copper and hydrogen sulfide greatly impact performance
- Useful on a very narrow municipal water qualities
- Harness is not removed but converted to abrasive insoluble crystals; the higher the hardness the more abrasive the water
- Electrical system **MUST** be proper grounded and bonded
 - Any stray voltage creates havoc with these units
 - Copper plumbing often used as earth ground
- No other contaminants managed other than hardness
- Sales are predicated on emotional environmental statements rather than technical superiority
- Energy conservation and minimalizing carbon foot print is environmental push back
- The issue of the “feel” of conditioned water to softened water is purely subjective

Pretreatment will Drive up Costs on these Units; One trick pony

Questions



PENTAIR