

# NS PRO – CATALYTIC HARD WATER CONDITIONERS

## CHEMICAL FREE LIMESCALE PREVENTION WITHOUT THE USE OF POWER OR MAGNETS

NaturalSof PRO is an industry proven catalytic solution to hard water limescale build-up as an alternative to conventional ion exchange units or in applications where ion exchange units are not possible. NaturalSof PRO does not soften water in the traditional sense of removing calcium and replacing it with sodium. Instead, NaturalSof PRO uses the properties of calcium carbonate (limescale) to our advantage by creating a soft non-bonding limescale crystal. The crystals are less than 1 micron. They flow to a drain in single pass applications and are removed through blow down in recirculating applications. NaturalSof PRO does not add anything to your water and does not remove anything either.

NaturalSof PRO consists of a non-sacrificial lead-free catalytic core made from a special alloy housed within a non-reactive stainless steel (304) tube. The use of dielectric fittings are not necessary when specifying NaturalSof PRO.

Treat entire buildings or individual pieces of equipment. When protecting heating equipment, always remember to put additional NaturalSof PRO units on the hot water recirculating pumps.

Recirculating applications like water features or cooling towers must always have a NaturalSof PRO sized for the recirculating loop, and not just the make-up water. A portion of the basin water can be recirculated to utilize a smaller NaturalSof PRO unit. In this case, 20% of the total recirculating flow is recommended.



### FEATURES

- No Maintenance for 10-15 years
- Chemical Free & Environmentally Friendly
- Zero Footprint, No Wasted Space
- No Waste Water
- No Power Requirement
- Uninterrupted Water Flow
- No Magnets
- Product Life Expectancy is 10-15 Years



The Oak Ridge National Laboratory report concluded: "The technology has demonstrated its effectiveness in this study, and should be considered for adoption by GSA facilities that are experiencing scaling issues in water heating systems. Most larger GSA facilities use cooling towers and hydronic heating systems to meet HVAC needs. These also would benefit from this technology."

### INSTALLATION GUIDANCE

NaturalSof PRO can protect entire buildings or specific pieces of equipment as long as it is sized for the correct flow rate and never over-sized.

When protecting heating equipment, always place secondary units on hot water re-circulation loops.

Re-circulating applications like water features or cooling towers require a unit sized for the recirculating flow rate and installed in this loop. An additional unit may be required for the make-up water depending on loss. A smaller NaturalSof unit could be sized if a portion of the basin was circulated, we recommend no less than 20%.

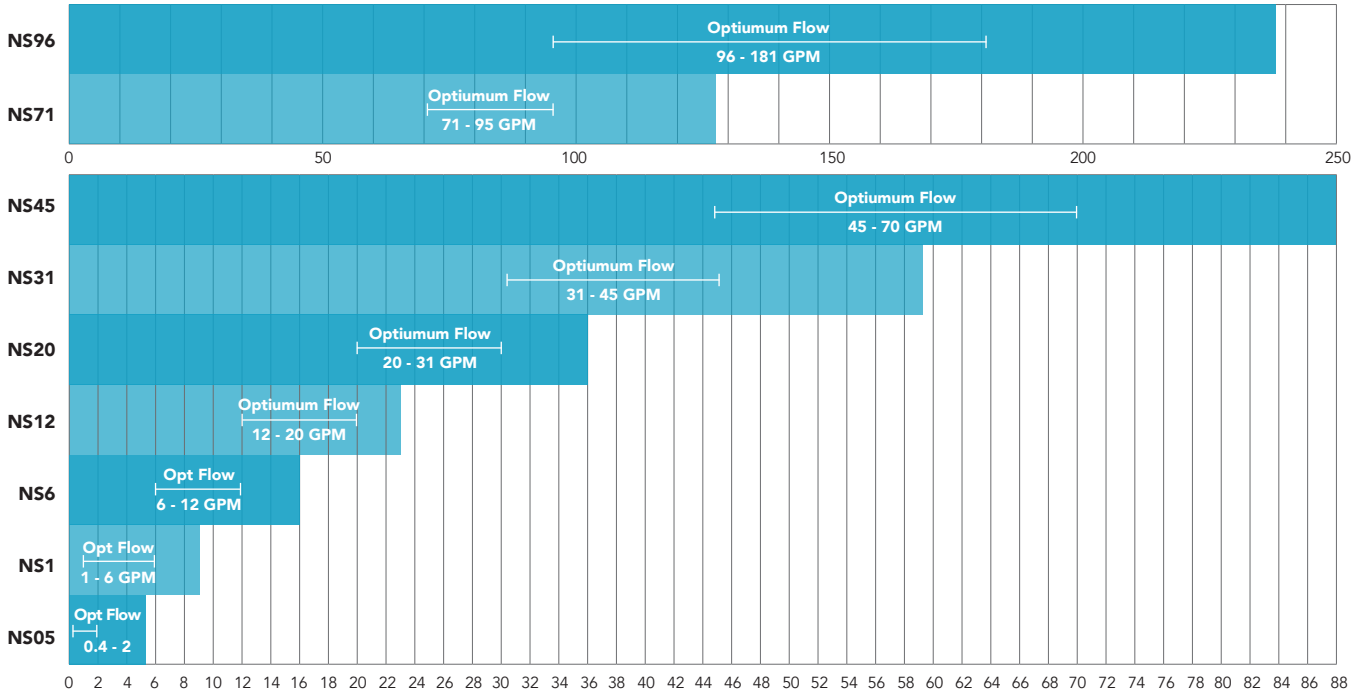
Low flow applications like ice machines, dishwashers and humidifiers must be treated individually even when a larger unit protects the main line. {P/N - NS0S or NS1}

Refer to page 2 for NaturalSof PRO sizing by flowrate

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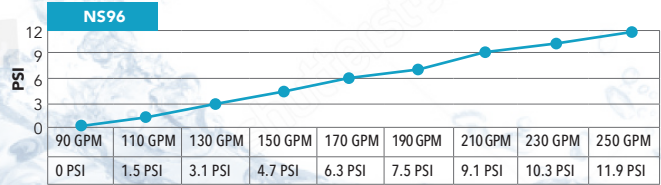
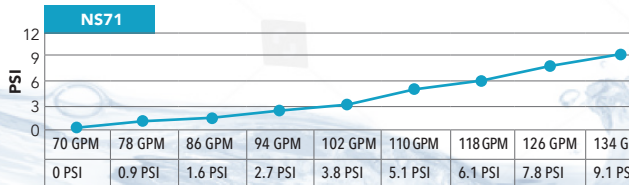
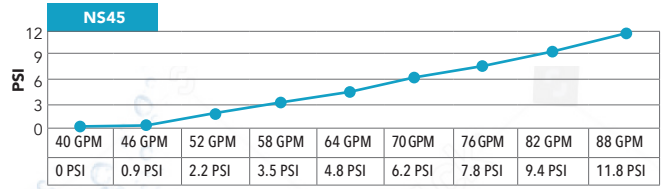
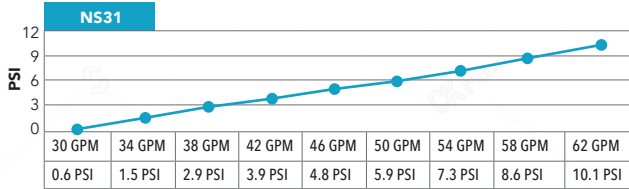
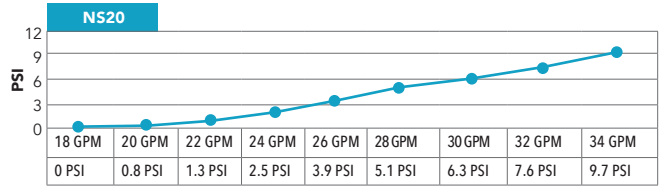
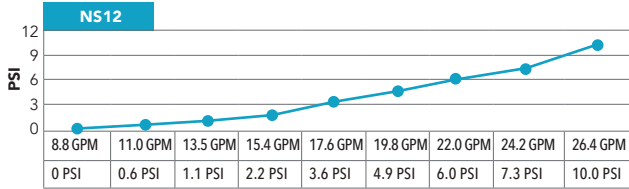
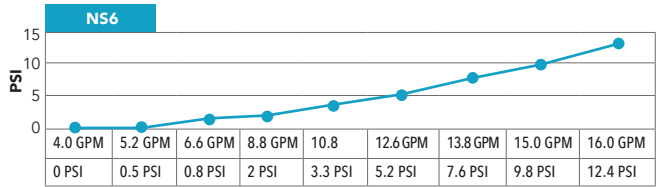
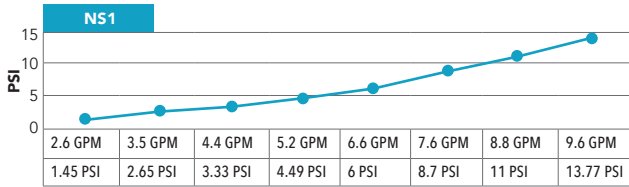


## NATURALSOF PRO PRODUCT SELECTION GUIDANCE CHART



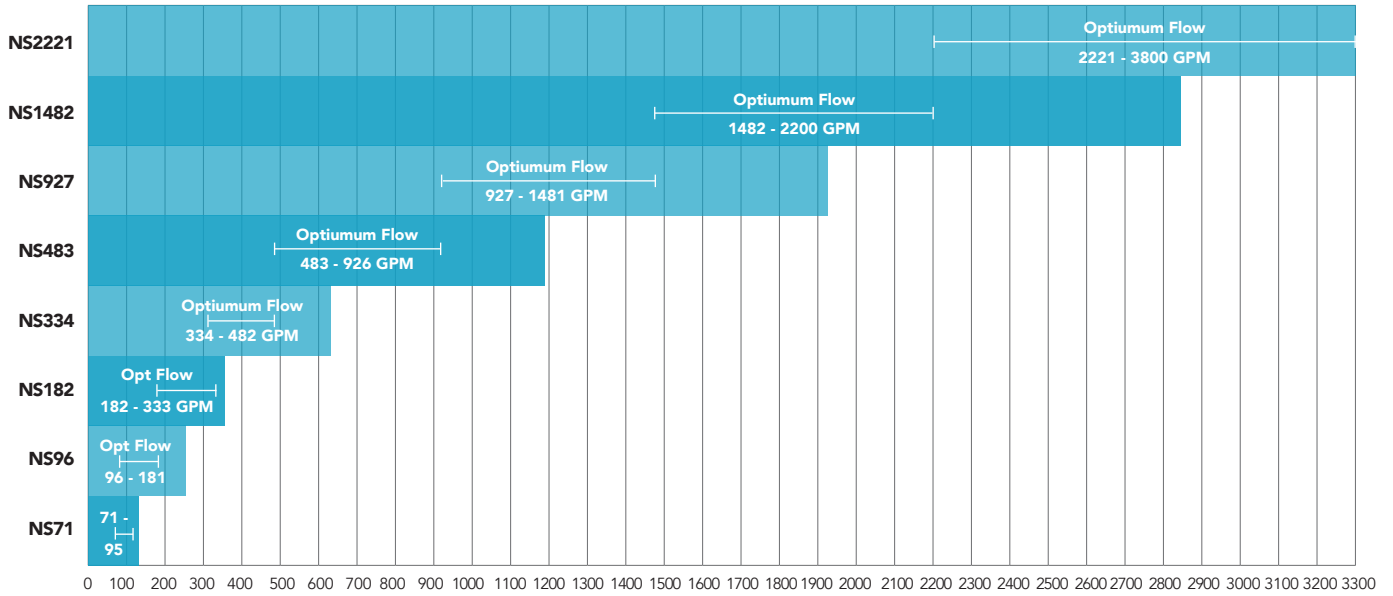
	NS05	NS1	NS6	NS12	NS20	NS31	NS45	NS71	NS96
<b>Pipe Size</b>	3/8"	1" (or 1/2" Option)	1" (or 3/4" Option)	1"	1.25"	1.5"	2.0"	2.5"	3.0"
<b>Length (in)</b>	10"	11.5"	12.625"	12"	24"	24"	24"	30"	32"
<b>Weight</b>	.44 LBS	2.0 LBS	3.0 LBS	3.3 LBS	8.6 LBS	10.1 LBS	15.2 LBS	17.0 LBS	25.0 LBS

## PRESSURE DROP GRAPHS



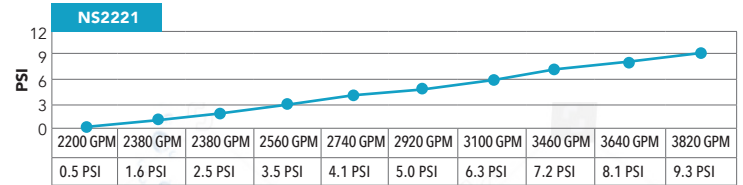
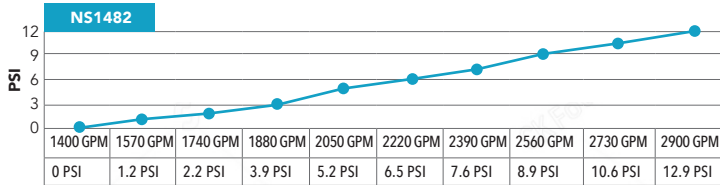
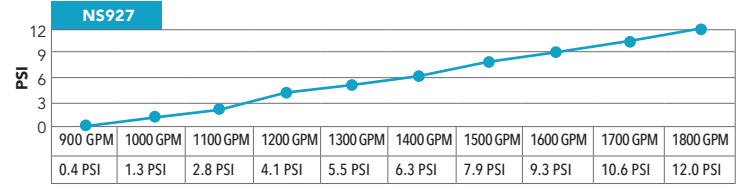
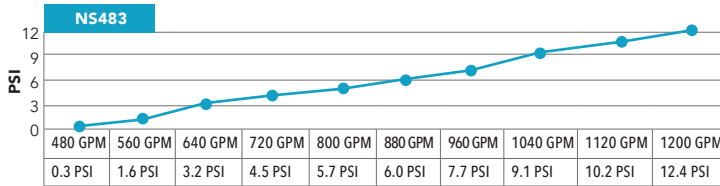
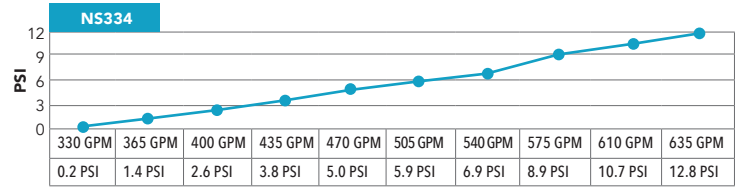
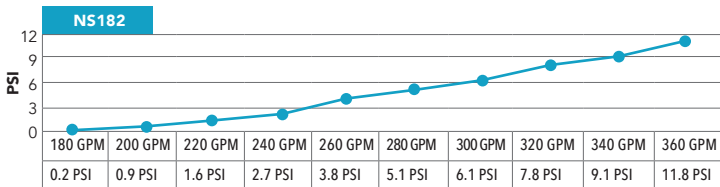
**Disclaimer:** Failure to consult with the company to obtain approval for installations on steam boilers and cooling towers (including evaporative condensers) will void any products warranty. No liability will be accepted for unauthorized installations on the aforementioned equipment.

## NATURALSOF PRO PRODUCT SELECTION GUIDANCE CHART



	NS71	NS96	NS182	NS334	NS483	NS927	NS1482	NS2221
<b>Diameter</b>	2.5"	3"	4"	5"	6"	8"	10"	12"
<b>Length (in)</b>	36"	36"	36"	36"	36"	36"	36"	36"
<b>Weight</b>	33 LBS	44 LBS	55 LBS	77 LBS	87 LBS	99 LBS	110 LBS	125 LBS
<b>Max Pressure</b>	232 PSI	232 PSI	232 PSI	232 PSI	232 PSI	232 PSI	232 PSI	232 PSI

### PRESSURE DROP GRAPHS



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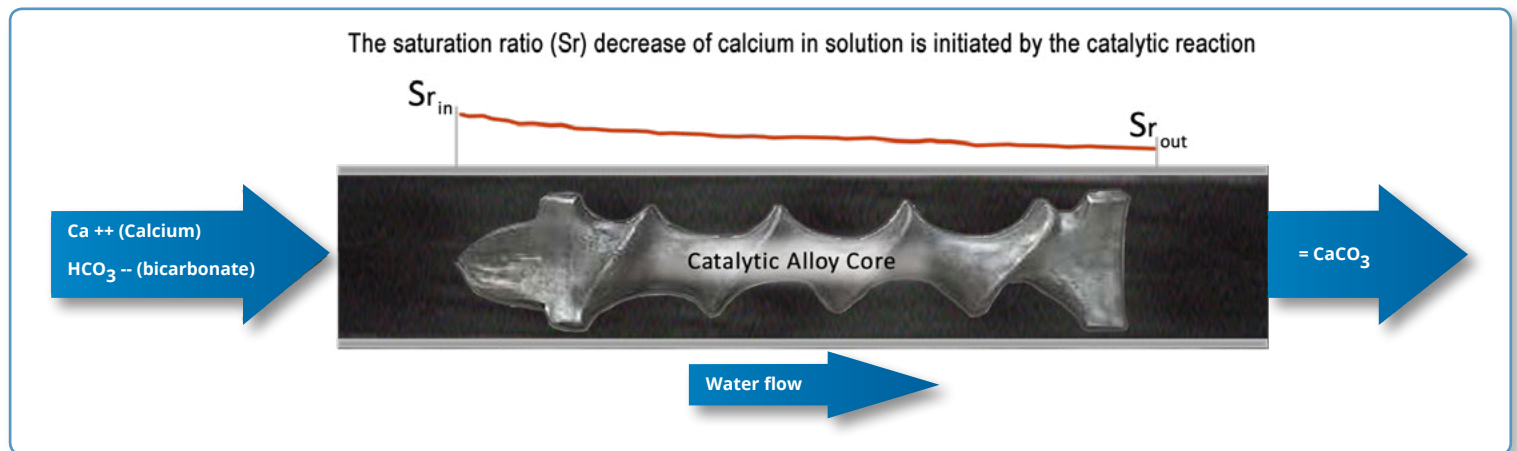
# WATER CONDITIONING AND HOW IT WORKS

We think of water as a clear liquid but water really contains suspended solids as well as dissolved minerals and gases. These components are picked up as water passes through nature on the way to our homes. Water hardness is measured by the amount of dissolved calcium and magnesium in water.

**Note:** While magnesium contributes to the hardness level it's calcium that causes hard scale, so that's what we address here.

## How does hard water cause us problems?

Water will only dissolve a certain amount of calcium dependent upon conditions. The amount of dissolved calcium that can be held in water reduces as temperature or pH increases. Using temperature as an example, let's take a hard water and heat it to a temperature (x) where the water is at its absolute maximum capacity for dissolved calcium. This is known as the saturation point. Now we'll continue to apply heat taking the temperature above (x). As we exceed the saturation point an amount of dissolved calcium is forced out of solution (it precipitates meaning it is no longer dissolved).



When calcium precipitates in this way it can combine with bicarbonate to form a hard calcium carbonate scale called **calcite** that bonds to the nearest receptive surface.

To prevent this from taking place our treatment reduces the amount of dissolved calcium by precipitating calcium carbonate in a form called **aragonite**, harmless insoluble crystals that are carried through the system to the drain or consumed.

**Our treatment uses a catalytic reaction to induce the precipitation of aragonite (details below):**



**Calcite**, a form of calcium carbonate, is what we call limescale or scale. When calcium carbonate precipitates as calcite it forms a hard deposit that causes numerous problems adhering to any receptive surface requiring acid or a significant mechanical effort to remove.



**Aragonite**, another form of calcium carbonate, has very different characteristics to calcite. When calcium carbonate precipitates as aragonite it forms a non-adhering harmless insoluble crystal that is either consumed or carried through the system to the drain.

- The NaturalSof scale prevention product line utilizes a non-sacrificial lead free alloy core with a special surface. As water passes over the core a catalytic reaction takes place.
- The reaction causes carbonic acid to precipitate. The reduction of this acidic component increases the pH of the solution.
- This pH increase triggers calcium and bicarbonate to come out of solution combining to form calcium carbonate (CaCO<sub>3</sub>) in its aragonite state. The pH increase is only temporary so there's no difference in pH readings before and after the unit.
- Catalytic treated water has a greater capacity for calcium. This greater capacity prevents scale deposition and in many cases any pre-existing scale is gradually absorbed.