

## WATER TREATMENT FOR HOMES IN SANTA BARBARA

### INTRODUCTION:

As residential plumbing contractors in Santa Barbara, we field questions every day about our local water quality and are asked for recommendations regarding water treatment. This article is intended to answer the questions we encounter most often, and to give our opinions regarding strategies to make our water taste good, clean our bodies and clothing better, preserve the appearance of new plumbing fixtures and glass items, and feel “soft” without feeling slimy. Please keep in mind that we are neither chemists, nor water quality engineers, but, rather, contractors who have dealt with this issue in the field for over 40 years. Also, it is important to understand that we are talking about water delivered by the various water districts from Carpinteria through Goleta, which we have found to be very similar, although we cannot comment on water outside the Santa Barbara area.

We divide the question of residential water treatment into 2 distinct categories. This is important because we have never seen a single strategy that deals with both issues effectively:

- 1) Whole-house Water Conditioning: This is treatment for all the water in one’s home, hot and cold, with the goal of mitigating water “hardness”, and, occasionally, to remove chlorine. These systems always isolate “house” water from “irrigation” water, which is used outside the home, mostly to water plants, and needs no treatment.
  
- 2) Drinking Water: Treatment of the small amount of water in one’s home that is used for drinking and, perhaps, cooking.

Before we examine these 2 issues in detail, we want to deliver the good news: Our recommended strategies for both are simple and inexpensive, because they are based on the use of non-proprietary technology.

## 1) Whole-house Water Conditioning

Water in Santa Barbara is considered extremely “hard”. Wikipedia defines this as follows:

**Hard water** is water that has high mineral content (in contrast with *soft water*). Hard water has high concentrations of  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  ions. Hard water is generally not harmful to one's health but can pose serious problems in industrial settings, where water hardness is monitored to avoid costly breakdowns in boilers, cooling towers, and other equipment that handles water. In domestic settings, the hardness of water is often indicated by the *non*-formation of suds when soap is agitated in the water sample.

To quantify this, our “hardness” measures more than 25 grains-per-gallon of calcium and magnesium. Anything over 10.5 GPG is considered “Very Hard” by Texas A&M University (<http://agfacts.tamu.edu/D10/Comal/FCS/Water/F1/nhardwtr.htm>)

For the homeowner, this means the following (again from Texas A&M):

Minerals which cause hardness in water have a wide impact on households. Hard water interferes with almost every cleaning task from laundering and dishwashing to bathing and personal grooming. Clothes laundered in hard water may look dingy and feel harsh and scratchy. Dishes and glasses washed in hard water may be spotted on drying. Hard water may cause a film on glass shower doors, shower walls and bathtubs. Hair washed in hard water may feel sticky and look dull. Hard water also affects the performance of household appliances.

It is our opinion that Santa Barbara water must be softened. However, many people resist water softening. The following is a list of their concerns and our responses to their questions:

1) **”Water softeners are expensive”** – The initial cost to purchase and install a high-quality softener averages around \$1800. This seems a worthwhile investment to preserve the finishes and appliances in your home and improve all aspects of cleaning.

2) **“The cost of salt or potassium is expensive”** – This runs about \$10/mo per person. using salt or \$25/mo. per person using potassium. Again, we feel this is worth the cost, given the quality of our water.

3) **“Softeners waste water”** – It is true that softeners use an average of 50 gal/week for regeneration. If we use the price of water in Santa Barbara, this costs about 60 cents per month.

4) **“Drinking soft water is bad for one’s health”** –We strongly recommend against drinking any water that is not run through a dedicated Drinking Water Treatment system. Soft water does not improve our water’s drinkability, and the small amounts of sodium and potassium it adds do not help.

5) **“I hate the “slimy” feeling of showering in soft water”** – Soft water improves the “*sudsing*” capacity of soaps. If one is used to bathing in hard water and changes to soft water, they will get that “slimy” feeling until they reduce the use of soap by 75%. This also applies to soap in dishwashers and clothes washing machines.

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The remaining question is: “Which softening system is best?”

Our experience is that traditional ion-exchange water softening is the best approach to whole-house water conditioning in Santa Barbara. Although there have been great improvements over the years in controls for these systems, particularly electronic “metering” that controls the timing of regeneration, the basic ion-exchange chemistry has not been improved upon.

Water softening technology was invented over 100 years ago, and the basic patents for modern systems were granted in the early 1950’s. Once these patents expired in the 1970’s, the cost of softeners dropped severely as the equipment became a “commodity”. The response of the water treatment industry was to invent new technology which could be patented and sold as “breakthrough” and “revolutionary” – proprietary products which could be sold for much

more money. In our experience, no one has improved on the basic 1950's softening technology that is non-proprietary and inexpensive.

New homeowners are often barraged with offers from salespeople for water treatment companies. We suggest they respond with 2 questions:

1) Can you guarantee that my wine glasses will come out of the dishwasher perfectly crystal clear?

2) Can you give me the name of 5 previous customers who will confirm a "yes" answer to question #1?

If the salesperson can answer both questions "yes", they are selling an ion-exchange softener souped-up with features to sell for a higher price. These are features that the homeowner doesn't need.

**Conclusion:** The best strategy for whole-house water conditioning in Santa Barbara is traditional, non-proprietary, ion-exchange water softening. The complete cost starts at about \$1800. installed, with most systems costing between \$1600 and \$2000. For very big homes (6 or more bathrooms, this cost can go as high as \$3700.)

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## **2) Drinking Water Systems**

There are 2 reasons to treat drinking water – taste and health considerations. For our purposes, we are only going to deal with taste as a consideration. The issues surrounding drinking water and its health effects are far beyond the scope of this article.

There are 2 basic strategies to treat water for drinking, and almost all commercial products use one of these:

1) Granular Activated Carbon  
([http://en.wikipedia.org/wiki/Activated\\_carbon](http://en.wikipedia.org/wiki/Activated_carbon))

2) Reverse Osmosis ([http://en.wikipedia.org/wiki/Reverse\\_osmosis](http://en.wikipedia.org/wiki/Reverse_osmosis))

We strongly recommend Reverse Osmosis. Our experience is that carbon filters do not deliver the “bottled water” taste that people have come to expect from drinking water.

Customers’ concerns about Reverse Osmosis are similar to their concerns about water softeners. There is water thrown away during the RO process, typically one gallon for every gallon used. Again, we feel this is worth the cost to get delicious, “bottled” quality drinking water. Please keep in mind that most bottled drinking water is nothing more than municipal water run through RO systems.

RO, like ion-exchange softening, is also inexpensive - and for the exact same reason. The original patents, established in the 1950’s, expired decades ago, turning the technology into a non-proprietary commodity. Consequently, a typical RO system installed below a kitchen sink with a single dispenser on the deck cost about \$650. The yearly cost for new filters runs about \$80., plus labor if the customer wants the filters installed by a plumber.

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**CONCLUSION:**

We recommend non-proprietary technology for both aspects of water treatment in Santa Barbara – Traditional ion-exchange Water Softening for whole-house conditioning, and Reverse Osmosis for drinking water. There are many options to minimize or expand these systems, and we will be happy to discuss those with you.

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