



## Dealing with hard water

### The Problem:

Hard water is nasty. It's tough on pipes, pots and pans and especially your laundry. You know it when you have it: stiff, perpetually stained and even smelly clothes. The culprit is usually calcium or magnesium. Hard water minerals bind themselves to detergent molecules and keep the detergent from working properly. Unfortunately, not even Charlie's Soap is an exception to this rule.

Water can vary in its hardness from town to town and, in some cases, even from day to day. Your town can test your water. Below is a scale that explains what the numbers mean.

Water Hardness Scale	
Milligrams Per Liter (mg/L) or Parts Per Million (ppm)	Classification
less than 17.1	Soft
17.1 - 60	Slightly Hard
61 - 120	Moderately Hard
121 - 180	Hard
over 180	Very Hard

### The Solution:

So what do you do about it? You want to treat the problem, not the symptoms. Chemicals like fabric softeners, perfumes and brighteners hide the symptoms of hard water but do nothing to treat the underlying problem. Worse yet, they put more chemicals on your clothes, on your body and down the drain than are necessary or healthy.

One simple way to combat hard water is to use water as hot as recommended by the fabric. Even though more minerals are likely dissolved in hot water, Charlie's Soap will work better in hot water.

A better solution is to soften the water. A whole-house water softening system will replace the calcium and magnesium with sodium, which does not affect your wash. But such systems aren't something you can just run down to the store and buy. The alternative is to purchase a chemical, in-wash water conditioner. There are several of these available, including Charlie's Soap Booster and Hard Water Treatment.

These water conditioning chemicals come in two categories: precipitating and non-precipitating. The former includes things like zeolite clays, washing soda, borax. These options are inexpensive, readily available and fairly effective. Through different chemical or physical methods, they grab calcium and magnesium and separate them from the solution -- "precipitating" them. It is then up to your washer to grab this precipitate and send it down the drain. In light to moderately hard water scenarios, this is a viable solution. However, with harder water, a new set of problems may be caused by the precipitate. The detergent is indeed working better, but the precipitate can become trapped in your clothes, making them stiff and irritating.



The better all-around solution is a non-precipitating phosphate conditioner. Charlie's Soap Booster & Hard Water Treatment is such a conditioner. These chemicals grab the calcium and magnesium but keep them in solution. The detergent now works properly and the problem minerals rinse easily down the drain to leave clothes clean, fresh and soft. Charlie's Soap Booster & Hard Water Treatment uses potassium diphosphate (TKPP) to safely eliminate hard water problems and be environmentally friendly. Phosphates are only a problem with overuse such as a fertilizer in agriculture.

To effectively soften 75 liters (or 20 gallons – a typical wash load) of hard water theoretically (based on replacement reactions alone) requires 2.5 times the concentration of non-precipitating water conditioner as there is hardness in your water. For instance, very hard water might register as 200 ppm, so it would take 500 ppm of a phosphate to soften this water. Thanks to the chelating properties of the TKKP used in Charlie's Soap Booster, much less is required. Only 100 ppm of TKKP is required to soften 200 ppm hard water (½ tablespoon in a typical wash load). However, a full tablespoon will enhance washing even better. Test on garments that may bleed or fade. At these concentrations, Charlie's Soap Booster is readily absorbed back into the environment and will not upset the delicate bacteria balance in septic systems.

How much Charlie's Soap Booster to use		
Milligrams Per Liter (mg/L) or Parts Per Million (ppm)	Water Classification	Charlie's Soap Booster
less than 17.1	Soft	None*
17.1 – 60	Slightly Hard	1/3 scoop*
61 – 120	Moderately Hard	½ scoop
121 – 180	Hard	½ scoop
over 180	Very Hard	½ to 1 scoop

- \* Unless the garments are just beyond filthy.
- \* 1 Scoop = 1 Tablespoon

### Other hard water problems and solutions

It is possible to not realize how hard your water is. Other detergents' chemical buildup can hide the symptoms. Charlie's Soap will eventually remove those chemicals, but if your water is hard, a layer of lime or even rust stains could be revealed. Water conditioners only prevent this type of buildup but cannot remove it once it is in the fabric. To solve this problem, soak the garments in the washer for an hour or two with water and two cups of vinegar. The acid will gently burn off the mineral residues. Drain the water and repeat. Then wash the garments with Charlie's Soap for Laundry and the Booster to remove acid and any loosened detritus. Vinegar in the rinse water can prevent further deposition of minerals in the rinse water.

You can also use vinegar to remove lime or rust deposits on surfaces. Daily cleaning with Charlie's Soap surface cleaners will prevent the buildup from returning. If you have further questions about how to deal with hard water, please call our offices any time during the work week. We'll be happy to help in any way we can.