

## Water Treatment Requirements

### Overview

pH: 7-9

Total Hardness: 2-6 grains

TDS: 50-200 mg/L

Alkalinity: 40-100 mg/L

Chloride: <30 ppm

Silica: <10 ppm

Chloramine: <.1 ppm

Chlorine: <.1 ppm

Improper water treatment is the most frequent cause of espresso machine damage. Water is complex and varies significantly between regions, so take great care to test the water quality at your location and adjust as necessary. Employ the help of a reliable company (Slayer recommends OptiPure and BWT) to evaluate your water and recommend and administer treatments. When evaluating water quality, the two most important factors to consider are **calcium carbonate** and **chloride**:

Calcium Carbonate: dissolved mineral that determines the "hardness" or "softness" of water.

The desirable range of hardness is **2-6 grains**. Over time, calcium carbonate accumulates as a hard substance, called "scale", and will inhibit the flow of water. Machines subjected to "harder" water (greater than 6 grains) will accumulate scale faster and require maintenance sooner.

Chloride: chlorine combined with an electron from a negatively charged ion.

Chlorides produce salts that impart a strong taste, which alters the flavor of the espresso. Chlorides also encourage pitting corrosion, which causes damage to the machine. Incoming water should have no more than **30ppm** chloride content.

Your water filtration company will create a treatment plan based on your water needs. Choose a filtration company that has solutions for addressing issues related to *both* calcium carbonate and chloride.

Common treatment options include:

Carbon Filtration: a process by which water passes through the granular activated carbon, which attracts and retains many chemicals in the water that have an unpleasant color, taste or odor. Carbon filtration is necessary for all machines. For water with **3-5 grains of hardness**, carbon filtration is likely the only necessary water treatment.

Ion Exchange: a process by which water passes through an ion exchange system, where undesirable mineral components are retained and more desirable substances such as sodium are released. An ion exchange system should be used in combination with a carbon filtration system and is especially beneficial for water in the range of **6-9 grains of hardness**. This system is relatively inexpensive and effective in removing inorganic substances. It does not, however, remove organic substances, such as bacteria.

Reverse Osmosis with a Blend-Back Valve (or Remineralized RO): a process by which water is forced through a semipermeable membrane with selective pore sizes at high pressure, then blended with the appropriate amount of desired minerals. Reverse osmosis may be a good solution for water in the range of 6-9 grains of hardness and is **mandatory for water above 9 grains**. When blending minerals with the filtered water, target a TDS (total dissolved solids) value of 75-125 ppm. Experiment with various TDS levels to determine what produces your preferred taste. All Slayer espresso machines need to be connected to a carbon water filter to remove chlorine, sediments, odor, and undesirable tastes. This requirement is in addition to any other necessary water filtration systems. Filtration requirements may vary seasonally. Water should be tested during each season to determine the best filtration plan. Once a filtration method has been selected, take note of the filter's peak capabilities. Replacement of filtration is based on volume and varying levels of hardness. Contact the filtration provider or vendor to inquire about the life expectancy of the filters, then schedule replacement and installation accordingly.

\*\*\*IMPORTANT: Damage to or failure of your machine due to inadequately treated water is not covered under warranty. Every time a new water filter is installed, thoroughly rinse the filter before attaching it to your machine or pump. Run water from the supply line through the filter and down a drain for at least 2 minutes, fully washing the filter and the residue or loose fibers in the filter cartridge. Skipping this step will cause damage to your machine.