9. Test Results of Water Surface Tension

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This section presents test results of reduced water surface tension produced by the FRE-FLO™ technology.

It is well-known in the scientific community and among manufacturers that reducing water surface tension has the benefit of allowing water to spread out, to permeate and more effectively get to more areas. Following are three FRE-FLO™ tests done in 2011 and 2008 of untreated and FRE-FLO™ treated water, testing for any changes in water surface tension produced by FRE-FLO™ technology (and specifically for a reduction in water surface tension).

Since experience over several decades has shown that FRE-FLO™ works exceptionally well in water having high total dissolved solids (TDS), we also hypothesized that water with higher TDS (that has a high level of calcium and carbonate ions) would exhibit a greater reduction in water surface tension (after going through a FRE-FLO™) than water with lower TDS. This is consistent with the fact that most high TDS water has a large amount of calcium and carbonate ions in the water, with which the FRE-FLO™ can react (since FRE-FLO™ is designed to specifically work with calcium carbonate).

When Dr. Chang (see "Principles of Catalytic Water Conditioning") predicted that it was difficult to measure the difference in water surface tension, we accepted the challenge. We gathered samples from each location listed below:

- A control sample of untreated irrigation water in Mexico in 2008 was collected. Then a FRE-FLO™ treated test sample was immediately collected from the same water source (having gone through one pass of FRE-FLO™ Model # 125-075 PVC). The TDS was a very high 2,300.

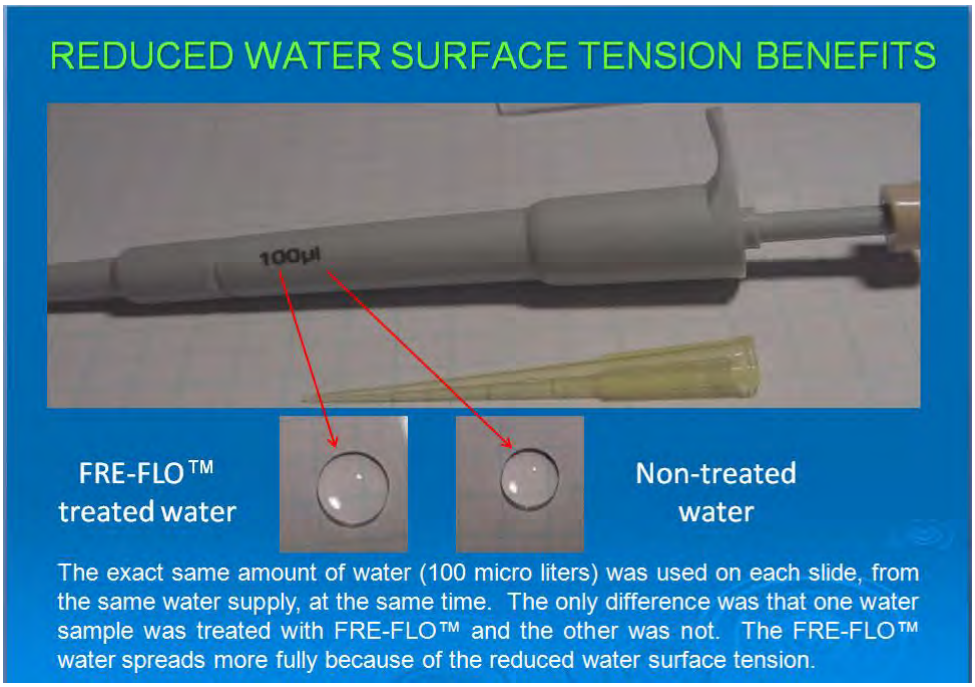
- A sample of untreated tap water from a private residence in Santa Monica, CA was collected in 2011. Immediately afterward, a sample of FRE-FLO™ treated water from the same source was collected. The FRE-FLO™ treated water had only one pass through FRE-FLO™ Model # R075-025 PVC. The TDS was in a more moderate range at 480.

- In 2011 another sample of untreated tap water was collected from a private residence in Santa Monica, CA. Immediately afterward, a sample of FRE-FLO™ treated water from the same source was collected, after only one pass through FRE-FLO™ Model # R075-025 PVC. The TDS was even lower at 255.

All of the test measurements were done with the water samples at room temperature (73.5^0F). The TDS and temperature was recorded using a Myron L AR1 Conductivity Meter. A glass slide was wiped with distilled water to clean the slide. Then using a Micropipette (using a 100 micro liters tip) a sample of water was drawn from each sample bottle, the outside of the micro tip dried (to eliminate the water drops still on the outside of the disposal tip), and the water sample was placed on the glass slide. Using a macro lens built into the camera, a tripod held the camera to a fixed focal length, a picture was taken, the camera was moved to the next water drop, moving the slide as little as possible, and another picture was taken. The camera was then connected to a computer and the pictures were downloaded. Each picture taken was then printed in 8" x 10" format. Then using a digital caliper, each water drop (of

exactly 100 micro liters each) was measured in millimeters (mm) four ways to get an average of the diameter size of each sample water drop. This averaged number was then divided by the increase in the diameter of the water drop (which is a measurement of the reduced water surface tension that allows the water drop to expand out over a wider surface area). The wider the area of the water drop, the more reduced is the water surface tension. The numbers are presented in the chart.

The results demonstrate that FRE-FLO™ produces reduced water surface tension:



The following results for each test show the percent (%) difference in water surface tension between untreated water and FRE-FLO™ treated water from the same source. Since each drop of water was exactly 100 micro liters, if no change was produced by the FRE-FLO™ technology in water surface tension, then the diameter of the FRE-FLO™ treated water sample would have been the same diameter as the untreated water. However, results show measurable changes produced in the FRE-FLO™ treated water. The wider diameter of the FRE-FLO™ treated water (compared to the untreated water) in each test, shows the FRE-FLO™ treated water has spread more fully, over a wider area, as is expected when there is reduced water surface tension.

The following data further clarifies the results:

Mm Diameter	TDS	Water Sample	% Difference
7.8	2,300	Untreated irrigation water from Mexico	21.8 %
9.5		From same source, FRE-FLO™ treated irrigation water with one pass	
66.73	480	Untreated tap water from residence in Santa Monica, CA	6.7 %
71.23		FRE-FLO™ treated water from same source with one pass	
58.75	255	Untreated tap water from residence in Santa Monica, CA	3.4 %
60.95		FRE-FLO™ treated water from same source with one pass	

In conclusion, in addition to the results showing considerably reduced water surface tension produced by the FRE-FLO™ , the test results also show (as expected) that the greater the TDS in the water, the greater the reduction in water surface tension.

FRE-FLO™ technology demonstrates functioning that produces a reduction in water surface tension, which provides numerous properties of effective hydration and improved permeability.

The test results of reduced water surface tension produced by FRE-FLO™ are consistent with the FRE-FLO™ principles of operation, and with Dr. Chang's analysis of principles of the FRE-FLO™ catalytic water conditioning.