History of Sterisil

Brad Downs, (President and CEO) had just completed the first successful project contracted by the Army Corps of Engineers to treat 3 million gallons of contaminated groundwater from a missile silo complex in Colorado. The water was purified to a level allowed for discharge into the local stream. This success of this project encouraged him to consider engineering solutions for contaminated drinking water. The first project was in the jungle of Papua New Guinea where he designed a drinking purification system for missionaries that were becoming very ill from microbiologically contaminated water. A solar powered portable microbiological test lab was developed and packed into the actual tribal location to conduct the treatment verification testing. The treatment technology worked beyond expectations, which encouraged further evaluation of water treatment in other challenging environments.

Returning from Papua New Guinea, Brad and Theresa Downs coincidentally learned of the dental waterline problem highlighted on ABC's 20/20 in a piece called "Dentistry's Dirty Little Secret" (Feb 2000). A few months later, Dr. Shannon Mills, one of the leading experts with knowledge of dental waterline biological contamination, authored a the article "The Dental Unit Waterline Controversy, defusing the Myths, defining the Solution", published in JADA in October of that year. Mills described what the ideal chemical treatment agent would look like - it would be bactericidal, but not toxic or irritating the humans. It would discourage reformation of biofilm and t would not be corrosive to the dental units internal components. A continuous treatment would have no effect on enamel or dentin bonding agents. To be truly ideal, it would be inexpensive and easy to use. Although such an agent did not appear to exist, there were products that possessed some of those desired characteristics. Brad and Theresa saw this as a challenge worth pursing.

Over the span of a decade, Brad and Theresa Downs, through Sterisil, have developed a complete product line of patented dental waterline treatment technology that represents the only products registered by the U.S. Environmental Protection agency to disinfect and maintain dental output water equal to or below 10 CFU/ml bacteria, 50 times below the 500 CFU/ml Standard established by the centres for disease control and the American Dental Association.

With the above technology, dental unit manufacturers finally have the proven technology available to manufacture a dental unit that complies with the CDC guidelines, enabling the dentist to achieve compliance towards achieving high quality dental output water.

DUWLs Treated with Sterisil Silver Ion Based Products

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Objective: To investigate the efficacy of Sterisil silver ion based products in controlling heterotrophic bacteria of dental unit waterlines (DUWLs) in multiple dental offices over a four year period.

Material and Methods: The four silver ion based products tested were manufactured by Sterisil Inc. (Palmer Lake, CO) for controlling microbial contamination of DUWLs: PureTube and Citrisil tablets were designed for bottle systems; PureTube Plus for municipal water; and PureLine for multiple dental units. A total of 264 samples of DUWLs were collected from 28 dental offices. The standard method 9215D of the American Public Health Association was used for determining the heterotrophic plate count (HPC) by using the membrane filtration technique, R2A agar and incubation for seven days at 22˚C.

Results: Among the 54 samples treated with PureTube, 98.1% met the CDC guidelines of ≤500 CFU/ml. For the samples treated with PureTube Plus, 52 of 53 had ≤100 CFU/ml; only one exceeded 500 CFU/ml and required an additional shock treatment. The PureLine and Citrisil tablet group contained 117 and 40 samples, respectively; both products eradicated 100% of HPC.

Treatment	N	Heterotrophic Plate Counts (CFU/mL)				% Pass Rates(<500)
		≤10	10 - ≤100	100 - ≤500	≥500	
PureTube	54	45	8	2	1	98.1%
PureTube Plus	53	46	6	0	1	98.1%
PureLine	117	115	2	0	0	100%
Citrisil Tablet	40	36	4	0	0	100%
Total Samples	264	242	20	2	2	99.2%
% of total		9.17%	7.6%	0.8%	0.8%	

Conclusions: The data demonstrates that all four Sterisil's product perform equally well, exceeding the standards established by the CDC and ADA for dental water quality. To maximise the benefits of silver based products, adequate shock treatment is essential to control existing biofilm in DUWLs. Partially supported by Sterisil Inc.