

Toppen Health

### UltraSafe Micro Dental Chair Bottle Filter

The UltraSafe Micro is a unique product for dental inline water filtration. Unlike other products that inject chlorine, iodine or silver into the water bottle as a “dose and treat” technology, the UltraSafe Micro mechanically filters out more than 99.9999% of bacteria, and 99.99% of virus that are in the water bottle. The UltraSafe Micro allows dentists to use tap water in their chair side water bottles, while being assured that all dirt, debris, and biologicals have been removed. The leading competitors do not filter water – dirty water in, and dirty water out to the patient!

The UltraSafe Micro was tested against the leading competitors in a third party lab. The test results were stunning!

**Table 1 – Removal efficacy of Raoultella terrigena(RT) bacteria by UltraSafe MICRO 2” Filter at flow rate 0.07 LPM**

Unit number	Total filtered volume, gallons	Pressure drop at flowrate 70 mL/min, psi	Sample Number	R. terrigena		
				Influent, CFU/mL	Effluent, CFU/mL	Removal efficacy, LRV
U5	0.02	1.0	Sample #1	6.9x10 <sup>6</sup>	6	6.1
U5	150	1.0	Sample #2	1.4 x10 <sup>7</sup>	<2	>6.8

**Test duration – 6 running days and ~3000 minutes**

**Test 1: 6.1 Log equals 99.99991% retention of RT Bacteria at the beginning of the testing.**

**6.8 Log equals 99.99998% retention of RT Bacteria after 150 gallons of water**

In comparison, the leading competitors had the following results:

We conducted a study of removal efficacy of *Raoultella Terrigena* bacteria and MS2 bacteriophage by UNIT 1 and UNIT 2 Filter units at flowrate 100 mL/min as per Client's request. Unfiltered municipal tap water with total chlorine level of 0.9±0.1 ppm was passed through the units simultaneously at flowrate 100 mL/min for total of 90 minutes as follow: for 10 minutes (initial flushing) and 80 minutes (final flushing two hour after the first flush) intervals (total volume of filtered city water through each unit was approximately 9 L). Both units were then flushed with 1 liter of pure distilled water with conductivity of 0.2 µS/cm and after the flush all three units were challenged simultaneously with 200 mL each of challenge suspension of *Raoultella terrigena* bacteria at concentration 5x10<sup>5</sup> RT particles/mL and 2.3x10<sup>6</sup> MS2 particles /mL in distilled water with free chlorine level less than 0.01 ppm at a flow rate of 100 mL/min. The testing results for the dental units are summarized in the following Table:

**Table 1- Filtration efficacy of *Raoultella Terrigena* (RT) bacteria and MS2 bacteriophage by (Unit #1) and (Unit #2) at flow rate 0.1 Liter per minute**

Unit Name,c	MS2 LRVa ,b	RT LRVa, b
U1S1	3.6	TNTC ≈2.4
U2S1	3.4	TNTC ≈2.4

Notes: a)TNTC- too numerous to count. LRV value was estimated for TNTC cases; b) LRV- logarithm reduction value; c) S1- sample 1

The competitors' units failed after 10 liters of tap water. UltraSafe unit successfully treated 150 gallons (570 liters) to competitors 10 liters.