

## Case Study – Bacteria Testing of E.coli, Enterococcus, and Coliforms

Since we were unable to do this test directly with the KRIA Ionizer, a lesser strength option was used, the factories EcoClean all-purpose cleaner and disinfectant.

EcoClean and the KRIA Ionizer are both Superoxide (SO) based products. In fact, the ionizer is used to produce EcoClean, but the two products address entirely different problems.

EcoClean is in liquid form, made possible by the addition of three hydrogen atoms to a superoxide atom. This chemical combination produces a cleaner that is stable, yet powerful in its ability to remove pollutants. It is also a product that is applicable to small areas.

The KRIA Ionizer produces pure Superoxide (SO) in great quantities on a continuous basis. One Ionizer is capable of cleaning water to a distance of one mile in calm water and keep it oxygenated at a high level 24 hours per day. The pure SO is much more powerful than the EcoClean version both in quantity and because it does not carry the three hydrogen atoms attached to the superoxide atom. This is due to the fact that superoxide reacts by Fenton reaction. This means that the superoxide preferentially reacts with a carbon atom in an organic substance. The presence of three hydrogens reduces this ability.

**The SO produced by the Ionizer is magnitudes more powerful than EcoClean's SO.**

We contracted with an independent test lab in Denver, CO. called Reservoirs Environmental, Inc. to run tests on the three bacteria listed above. The test results are illustrated in their Report dated December 17, 2014 and January 2, 2015. See *test results on the next page*.

## Table I Analysis: Microbial Analysis

Client: ECO USA

Date Samples Received: December 10, 2014

Analysis Type: AOAC Method #s: APC: 990.12

Turnaround: 5 Day

Date Samples Analyzed: December 17, 2014

Client ID Number	Lab ID Number	R.L. (cfu/mL)	APC Conc. (cfu/mL)
<b>BACTERIA STRAINS</b>			
Innoculum E.coli		10	378,000,000
ATCC # 33495			
Innoculum Enterococcus faecium		10	420,000,000
ATCC # 25922			
Innoculum klebsiella pneumoniae		10	321,000,000
ATCC # 35667			
<b>BACTERIAL STRAINS + DISINFECTANT AT 30</b>			
#1 E.coli (30 Minutes)	EM 1311780	10	BRL
#2 Enterococcus (30 Minutes)	EM 1311781	10	950
#3 Coliforms (30 Minutes)	EM 1311782	10	300
<b>BACTERIAL STRAINS + DISINFECTANT AT 1 HOUR</b>			
#4 E.coli (1 Hour)	EM 1311783	10	BRL
#5 Enterococcus (1 Hour)	EM 1311784	10	4,160
#6 Coliforms (1 Hour)	EM 1311785	10	BRL
<b>BACTERIAL STRAINS AT 1 HOUR</b>			
Innoculum E.coli (1 Hour)		10	236,000,000
ATCC # 33495			
Innoculum Enterococcus faecium (1 Hour)		10	418,000,000
ATCC # 25922			
Innoculum klebsiella pneumoniae (1 Hour)		10	349,000,000
ATCC # 35667			

\* Sample analyses have not been blank corrected.

BRL = Below Reporting Limit

Minimum Reporting Limit (MRL) = 10 Cells

Laboratory performed analysis using ATCC bacterial strains to determine the effectiveness of the disinfectant provided.

**Note: a second test was done, January 2, 2015, on Enterococcus using double strength of EcoClean. The results after one hour were 840 cfu/mL and after 2 hours, the reading was BRL.**