Evaluation of Puritii™ Water Filter for Removal of Biological and Chemical Contaminants

A summary of 2017 Laboratory Testing of Puritii Water Filters commissioned by ARIIX

ABSTRACT/EXEC SUMMARY

Puritii Water Filters were challenged with microbiological (bacteria, virus and cryptosporidium oocyst analog) and chemical (inorganic, pesticides, VOCs et. al.) contaminants. The Puritii Water Filter removed greater than 99.95% of all microbiological contaminants, with the greatest reduction (>99.9999%) in the bacterial model.

STUDY OBJECTIVE:

This study measured the effectiveness of the Puritii Water Filter in removing microbiological and chemical contaminants from water. The study was conducted by an ISO/IEC 17025:2005 accredited laboratory.

STUDY DESIGN:

This study used a vacuum trap to draw water through the filter at a pressure of 3.4–3.6 inches of mercury. Ten liters of General Test Water (consisting of dechlorinated municipal water adjusted to NSF P231 guidelines) were drawn through each filter to condition it. Following conditioning of the filters, three (3) filters were used for each of the following contaminant categories:

- *Microbiological, including bacteria, virus and fluorescent microspheres*
- *Inorganic (heavy metals, nitrates, copper, fluoride)*
- *Pesticides and Volatile Organic Carbon (VOC) compounds*
- *Additional Chemicals (Free Chlorine, Bisphenyl-A, Esterone and Ibuprofen)*

For each challenge, one (1) liter of water containing the contaminant samples was used. Contaminant samples were prepared beforehand by adding the contaminant species to quantities of General Test Water.

Filter output was subsequently analyzed for contaminant content, and percent reduction was calculated by difference between pre-filtration and post-filtration contaminant concentrations.

RESULTS:

Microbiological Tests:

For the Bacterial challenge, Raoultella terrigena was used. This organism is a member of the Enterobacteriaceae family, making it a useful analog for related bacterial pathogens in this family, including E. coli, Salmonella and Shigella. In this challenge, the Puritii filter successfully filtered an average of 99.9999% of the bacteria.

The Viral challenge used MS-2 bacteriophage. This virus infects members of the Enterobacteriaceae family and was used in this study because it is similar in size and shape to viruses which infect the human gastrointestinal tract. Puritii filtered out an average of 99.95% of this virus.

The Microbiological test also included the use of fluorescent microspheres measuring 3.0 micrometers in diameter, which were used as a surrogate for Cryptosporidium oocysts. Puritii filtered out more than 99.997% of these microspheres.

Table 1. Removal of Microbiological contaminants by Puritii Water Filter

MICROBIOLOGICAL SPECIES	STARTING CONCENTRATION	AVG % REDUCTION	AVG OUTPUT
Bacteria (Raoultella terrigena)[1]	4.2 x 105 cfu/mL	99.9999	<0.45 cfu/mL
Virus (MS-2 Bacteriophage)[2]	5.7 x 105 pfu/mL	99.95	295 pfu/mL
3.0 µM Fluorescent microspheres[3]	3.3 x 104 particle/mL	99.997	<1 particle/mL