



ENVIROTEK LABORATORIES, INC.

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EPA ID # NJ01298 NJ DEP ID # 03048 NY ELAP ID # 12044

KLT 8 AVG FILTER MICROBIOLOGICAL TEST REPORT

Report # 16-119 (8 Avg)
Report Date: 04/16/2016
Customer Name: KLT Filtration Ltd.

EXECUTIVE SUMMARY

One Filter Element (model 8 Avg) was tested for Microbiological Reduction for a total volume of 500 liters. The filter element qualifies as a microbiological water purifier up to 500 liters.

INTRODUCTION

One Filter Element (model 8 Avg) was tested for Microbiological Reduction for a total volume of 500 liters. The filter element was challenged with tap water adjusted and spiked with E. coli, Klebsiella pneumoniae, and microspheres-3 µm (Cryptosporidium parvum, Giardia lamblia), tested using Standard Methods for the Examination of Water. The filter element qualifies as a microbiological water purifier up to 500 liters.

REAGENTS, MATERIALS, AND LAB EQUIPMENT

Barnstead Lab-Line Incubator
Escherichia coli NSI Lab Solutions Catalog # 9001H, Lot # 052215
Klebsiella pneumoniae NSI Lab Solutions Catalog # 8167, Lot # 092215.
Polystyrene Microsphere 3 µm (Cryptosporidium parvum, Giardia lamblia) Polysciences, Inc. Catalog # 17143-5
Sterile water, Phosphate buffer, 0.45 µm membrane filters.
Amscope EPI Fluorescence Microscope FM-320TA-3M.
KLT Filter Element model 8 Avg.

PROCEDURE

Flushed the filter element with approximately 4 liters of sterile water. Prepared 500 liters of challenge influent water with E. coli, and Klebsiella at a concentration of 10⁸/L each, and microspheres at 10⁶/L. Tables 2, 4, and 6 summarize the Influent water properties. Passed 500 liters of influent water through the filter element, at intervals of 50 liters, with a cycle of 25 minutes on/25 minutes off; at a flow rate of 2 liters/minute. Collected the effluent water and analyzed the filtered water every 50 liters for micro-organisms following the Standard Methods of Analysis of Water 21st Edition, methods SM 9222-D (bacteria); Cryptosporidium parvum, method SM 9711-B. The results are summarized in Tables 1, 3, and 5 below.

RESULTS

Table 1
Klebsiella pneumoniae Test Results

Accumulated volume	Influent Water Concentration	Filtered Water Concentration	% Reduction	Criteria: Minimum % Reduction 99.9999
Initial (1 liter)	10 ⁸ /L	0 CFU/L	99.9999	Passed
50 liters	10 ⁸ /L	0 CFU/L	99.9999	Passed
100 liters	10 ⁸ /L	0 CFU/L	99.9999	Passed
150 liters	10 ⁸ /L	0 CFU/L	99.9999	Passed
200 liters	10 ⁸ /L	0 CFU/L	99.9999	Passed
250 liters	10 ⁸ /L	0 CFU/L	99.9999	Passed
300 liters	10 ⁸ /L	20 CFU/L	99.9999	Passed
350 liters	10 ⁸ /L	20 CFU/L	99.9999	Passed
400 liters	10 ⁸ /L	40 CFU/L	99.9999	Passed
450 liters	10 ⁸ /L	50 CFU/L	99.9999	Passed
500 liters	10 ⁸ /L	50 CFU/L	99.9999	Passed

Table 2
Influent Challenge Water Properties

Parameter	Influent Challenge Water	Target
pH	7.70	6.5 to 8.5
Temperature	21.0 °C	20 ± 5°C
TDS	400 mg/L	50 - 500 mg/L
Turbidity	3.5 NTU	0.1 to 5 Nephelometric Turbidity Units
TOC	2.5 mg/L	0.1 to 5.0 mg/L



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Table 3
Escherichia coli Test Results

Accumulated volume	Influent Water Concentration	Filtered Water Concentration	% Reduction	Criteria: Minimum % Reduction 99.9999
Initial (1 liter)	10 ⁸ /L	0 CFU/L	99.9999	Passed
50 liters	10 ⁸ /L	0 CFU/L	99.9999	Passed
100 liters	10 ⁸ /L	0 CFU/L	99.9999	Passed
150 liters	10 ⁸ /L	0 CFU/L	99.9999	Passed
200 liters	10 ⁸ /L	0 CFU/L	99.9999	Passed
250 liters	10 ⁸ /L	0 CFU/L	99.9999	Passed
300 liters	10 ⁸ /L	0 CFU/L	99.9999	Passed
350 liters	10 ⁸ /L	10 CFU/L	99.9999	Passed
400 liters	10 ⁸ /L	10 CFU/L	99.9999	Passed
450 liters	10 ⁸ /L	20 CFU/L	99.9999	Passed
500 liters	10 ⁸ /L	20 CFU/L	99.9999	Passed

Table 4
Influent Challenge Water Properties

Parameter	Influent Challenge Water	Target
pH	7.75	6.5 to 8.5
Temperature	21.0 °C	20 ± 5°C
TDS	400 mg/L	50 - 500 mg/L
Turbidity	3.0 NTU	0.1 to 5 Nephelometric Turbidity Units
TOC	2.8 mg/L	0.1 to 5.0 mg/L

Table 5
Polystyrene Microspheres (Cryptosporidium parvum) Test Results

Accumulated volume	Influent Water Concentration	Filtered Water Concentration	% Reduction	Criteria: Minimum % Reduction 99.9
Initial (1 liter)	10 ⁶ microspheres/L	0 microspheres/L	99.99	Passed
50 liters	10 ⁶ microspheres/L	0 microspheres/L	99.99	Passed
100 liters	10 ⁶ microspheres/L	0 microspheres/L	99.99	Passed
150 liters	10 ⁶ microspheres/L	0 microspheres/L	99.99	Passed
200 liters	10 ⁶ microspheres/L	0 microspheres/L	99.99	Passed
250 liters	10 ⁶ microspheres/L	0 microspheres/L	99.99	Passed
300 liters	10 ⁶ microspheres/L	0 microspheres/L	99.99	Passed
350 liters	10 ⁶ microspheres/L	0 microspheres/L	99.99	Passed
400 liters	10 ⁶ microspheres/L	0 microspheres/L	99.99	Passed
450 liters	10 ⁶ microspheres/L	0 microspheres/L	99.99	Passed
500 liters	10 ⁶ microspheres/L	0 microspheres/L	99.99	Passed

Table 6
Influent Challenge Water Properties

Parameter	Influent Challenge Water	Target
pH	7.65	6.5 to 8.5
Temperature	21.0 °C	20 ± 5°C
TDS	440 mg/L	50 - 500 mg/L
Turbidity	4.5 NTU	0.1 to 5 Nephelometric Turbidity Units
TOC	2.8 mg/L	0.1 to 5.0 mg/L

CONCLUSION:

The KLT Filter Element model 8 Avg meets the requirements for the Microbiological Reduction up to 500 liters.



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Filter Stand Set-up



CERTIFICATION OF RESULTS:

I certify in writing that all analyses, and reporting performed herein, comply with all requirements set forth in N.J.A.C. 7:9E and N.J.A.C. 7:18, and hereby certify that this laboratory is in compliance with all laboratory certification and quality control procedures and requirements as set forth in N.J.A.C. 7:18; the NYCRR Subpart 55-2 and the National Environmental Laboratory Accreditation Conference (NELAC) Institute Standards.

Disclaimer: The test results are only related to the filter sample tested.

Jaime A. Young

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