



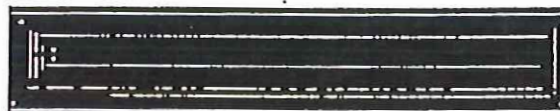
United States Testing Company, Inc.

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REPORT OF TEST

Primary Screening Study of HDI Pure Used Unit

Conducted for:



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TEST REPORT NO. 200643

SIGNED FOR THE COMPANY BY

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Samples: One filter unit was submitted and identified by the Client as:

Used Unit

Project: Antibacterial Effectiveness, Screening

Purpose: To determine in a ~~primary~~ screening test, the effectiveness of the submitted sample to reduce bacterial contamination. The screening study used water with minimal inorganic or organic supplements, and offers data only on primary efficacy.

Sample Description: White plastic filter housing, with influent and effluent hoses entering from the bottom of the unit.

Storage & Handling: Sample was stored under ambient conditions until test initiation.

Test Dates: 8/19 - 8/23/94

Test Organism: Escherichia coli ATCC # 11229

This organism is a fecal coliform, and as such is an indicator organism for water that has been fecally contaminated. Additionally, this strain is prescribed in AOAC Germicidal Sanitizer studies.

Test Water: All water used in this study was strictly defined. The prepared water was reconstituted, as defined in Standard Methods for the Examination of Water and Wastewater, 17th Edition, 1989, Section 5210 B, pp. 5-4 and 5-5. Constituents were added to purified water as follows:

<u>Chemical Compound</u>	<u>Concentration</u> (mg/L)
NH ₄ Cl	1.70
K ₂ HPO ₄	21.75
KH ₂ PO ₄	8.50
Na ₂ HPO ₄ · 7H ₂ O	33.40
NH ₄ Cl	1.70
MgSO ₄	22.50
FeCl ₃ · 6 H ₂ O	0.25
CaCl ₂	27.50

Flow Rates: ... the flow rate to be tested was 1/3 gallon per minute (gpm) Flow rates were determined by timing and adjusting volumetric fills. Pressure readings from an in house air pressure source which was used to drive the water through the filters were noted at appropriate flow rates and maintained.

Results:Table 1: Residual Iodine Levels

<u>Sample:</u>	<u>Volume Sampled</u> <u>(ml)</u>	<u>Iodine</u> <u>(mg/L)</u>
(Aged)	200	<0.2
Test Water	200	<0.2

Table 2: Antibacterial Data:E. coli organisms recovered at sampling times:

<u>Sample</u> <u>Replicates</u>	<u>E. coli</u> <u>(cfu/100ml)</u>	<u>Percent</u> <u>Reduction</u>
Initial	3.4×10^7	Not Applicable
A	<1	>99.99999%
B	<1	>99.99999%
C	<1	>99.99999%
D	<1	>99.99999%

Summary: Filtering test water through the
reduced viable E. coli counts.

Filter significantly

Conclusion:The filter tested at the prescribed flow rates reduced counts of viable
E. coli by more than 99.99999%.

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Inoculation: E. coli ATCC 11229 was cultured on Tryptic Soy Agar (TSA) at 35°C for 24 hours. Cells were harvested with buffered saline, and optical density was adjusted so that the final concentration was approximately 1.0×10^8 colony forming units (cfu) per ml. 4 ml were added to 4 liters of test water so that the final concentration of test water was ca. 1.0×10^5 cfu/ml. This water was then run through the test filter.

Sampling: Samples were taken at four separate intervals, the samples were taken directly from the effluent hose. 10 ml of 1 N sodium thiosulfate was added to the collection vessels to neutralize any residual iodine. Additionally, Plate counts were performed on inoculated water before the filtering event for an initial control reference.

Inactivation: Neutralization of the active agent in the filter resin was critical for deriving accurate and meaningful organism counts at the prescribed time intervals. 10 ml of 1 Normal sodium thiosulfate was added to sterile sampling containers. Sodium thiosulfate is frequently employed to inactivate halogen disinfectants, previous data indicate that this level of thiosulfate is adequate to neutralize expected residual iodine levels.

Organism Recovery: To achieve maximum sensitivity, membrane filtration was employed to determine viable organism levels. 100 ml of treated water was filtered through a 0.45 micron filter. This was then aseptically placed on a Tryptic Soy Agar Plate. TSA is a broad spectrum growth media and would allow for growth of injured microorganisms. A Violet Red Bile Agar overlay was then applied. VRBA is a selective media which would allow for direct E. coli detection. These plates were incubated for 24 hours at 35°C.

Iodine

Determination: Iodine determinations of water exiting the filter apparatus were made during the priming period, towards the end of the 5 gallon flush. A Fischer and Porter Amperometric Titrator Automatic was used for Total Iodine Determinations (see Table 1).