LifeStraw

Evidence Dossier

For LifeStraw

		Life Straw	Life Straw Steel	LifeStraw Go	LifeStraw Mission	LifeStraw Family	LifeStraw Community
BACTERIA (Removes 99.9999%)	Brucella melitensis	✓	✓	✓	✓	✓	✓
	Campylobacter jejuni	✓	✓	✓	✓	✓	✓
	pasteurella tularensis	✓	✓	✓	✓	✓	✓
	Pseudomonas aeruginosa	✓	✓	✓	✓	✓	✓
	Shigella	✓	✓	✓	✓	✓	✓
	Staphylococcus Aureus	✓	✓	✓	✓	✓	✓
	Vibrio Cholera	✓	✓	✓	✓	✓	✓
	Vibrio parahaemolyticus	✓	✓	✓	✓	✓	✓
	Yersinia enterocolitica	✓	✓	✓	✓	✓	✓
	Yersinia pestis	✓	✓	✓	✓	✓	✓
	Enteropathogenic E.coli	✓	✓	✓	✓	✓	✓
	Haemophilus influenzae	✓	✓	✓	✓	✓	✓
	Klebsielia pneumoniae	✓	✓	✓	✓	✓	✓
	Legionella pneumophia	✓	✓	✓	✓	✓	✓
	Mycobacterium Tuberculosis	✓	✓	✓	✓	✓	✓
	Mycoplasma pneumoniae	✓	✓	✓	✓	✓	✓
	Pseudomonas pseudomallei	✓	✓	✓	✓	✓	✓
	Salmonella hirschefeldii	✓	✓	✓	✓	✓	✓
	Salmonella typhimurium	✓	✓	✓	✓	✓	✓
	Salmonella typhosa	✓	✓	✓	✓	✓	✓
	Shigella dysenteriae	✓	✓	✓	✓	✓	✓
	Streptococcus pneumoniae	✓	✓	✓	✓	✓	✓
	Streptococcus pyogenes	✓	✓	✓	✓	✓	✓
PARASITES (Removes 99.9%)	Ascario lumbricoides	✓	✓	✓	✓	✓	✓
	Cryptosporidium	✓	✓	✓	✓	✓	✓
	Entamoeba	✓	✓	✓	✓	✓	✓
	Giadia Lamblia	✓	✓	✓	✓	✓	✓
	naegleria gruberi	✓	✓	✓	✓	✓	✓
	schistosoma mansoni	✓	✓	✓	✓	✓	✓
	taenis saginata	✓	✓	✓	✓	✓	✓
VIRUS (Removes 99.999%)	Adenoviridae virus				✓	✓	✓
	Astrovirus				✓	✓	✓
	Calicivirus virus				✓	✓	✓
	Enterovirus				✓	✓	✓
	Hepatitis A virus				✓	✓	✓
	Hepatovirus				✓	✓	✓
	Influenza				✓	✓	✓
	Norovirus				✓	✓	✓
	Parainfluenza				✓	✓	✓
	Paramyxovirus				✓	✓	✓
	Parvovirus B19				✓	✓	✓
	Rhinorvirus				✓	✓	✓
	Rotavirus				✓	✓	✓
	Togavirus				✓	✓	✓

This list is intended as complementary information and created considering pore size exclusion. All LifeStraw products are tested under standard laboratory conditions using ISO / IEC 17025 accredited methods.

LifeStraw

Internal Lab Report

Certificate of Analysis

PHÒNG THÍ NGHIỆM NƯỚC/ *Water Laboratory*
ISO/IEC 17025 accredited

Sample Information

Sample	: LifeStraw® Hollow Fiber		
Quantity	: 12 pcs	**Description**	: QC Finished goods
Date of receipt of test sample (dd/mm/yyyy)			: 27/02/2015

Analysis Results

Parameter		Microbiological log_{10} reduction		Physico-chemical characteristics		Conclusion
		Bacteria (*E.coli*)	Protozoa (3µm spheres surrogate)	Turbidity of effluent water (NTU)	Flow rate (ml/min)	
Reference method		SMEWW 9222G (*)	US EPA 05/9205/ EPADWC (Modified) (*)	SMEWW 2130B (*)	WL.SOP.106	
Specification		Min 6	Min 3	Max 0.5	Min 350	PASSED
1	LS0PR5B1002	>8.6	>5.1	0.3	2420	PASSED
2	LS0PR5B1002	>8.6	-	0.2	2000	PASSED
3	LS0PR5B1002	>8.6	-	0.1	2300	PASSED
4	LS0PR5B1003	>8.6	-	0.3	2280	PASSED
5	LS0PR5B1003	>8.6	-	0.2	2280	PASSED
6	LS0PR5B1003	>8.6	-	0.2	2300	PASSED
7	LS0PR5B1004	>8.6	-	0.3	2300	PASSED
8	LS0PR5B1004	>8.6	-	0.1	2640	PASSED
9	LS0PR5B1004	>8.6	-	0.2	2520	PASSED
10	LS0PR5B1005	>8.6	-	0.2	2420	PASSED
11	LS0PR5B1005	>8.7	-	0.3	2340	PASSED
12	LS0PR5B1005	>8.7	-	0.1	2440	PASSED

Note: (*) ISO/IEC 17025 accredited methods

VESTERGAARD®
IMPACTING PEOPLE

I, the undersigned, hereby declare that the findings provide a true and accurate record of the results obtained on samples as received.

Date and signature

10/04/2015

Pham Van Anh
Group Leader – Microbiology and Quality Control

VESTERGAARD®
IMPACTING PEOPLE

LifeStraw

External Lab Report

Department of Soil, Water and
Environmental Science
College of Agriculture and Life Sciences

THE UNIVERSITY OF
ARIZONA.
TUCSON ARIZONA

429 Shantz Building, #38
1177 E. Fourth Street
P.O. Box 210038
Tucson, AZ 85721-0038 USA
(520) 621-1646
FAX: (520) 621-1647
sw@ag.arizona.edu

EVALUATION OF VESTERGARD-FRANDSEN'S HOLLOW FIBER LifeStraw® FOR THE REMOVALOF ESCHERICHIA COLI AND CRYPTOSPORIDIUM ACCORDING TO THE U.S. ENVIRONMENTAL PROTECTION AGENCY GUIDE STANDARD AND PROTOCOL FOR EVALUATION OF MICROBIOLOGICAL WATER PURIFIERS

Jaime Naranjo, B.S.

and

Prof. Charles P. Gerba, Ph.D.

Department of Soil, Water and
Environmental Science

May 17, 2010

Department of Soil, Water and
Environmental Science
College of Agriculture and Life Sciences

THE UNIVERSITY OF
ARIZONA
TUCSON ARIZONA

429 Shantz Building, #38
1177 E. Fourth Street
P.O. Box 210038
Tucson, AZ 85721-0038 USA
(520) 621-1646
FAX: (520) 621-1647
sw@ag.arizona.edu

SUMMARY

Three identical Vestergaard-Frandsen's hollow fiber LifeStraw were evaluated for their ability to remove *Escherichia coli*, and *Cryptosporidium* oocysts. The units were operated according to the manufactures instructions until 1625 liters had been processed. The units were challenged with the test microorganisms after 0,250, 500, 600, 750, 900, 1000, 1150, 1250, 1450, 1500, 1575 and 1625 liters had passed through the units. Aging water used for the evaluation of the units had a turbidity of 15 NTU, total organic carbon of 5 mg/L (humic acid) and 400 mg/l total dissolved solids. All challenge tests were conducted with "worst case" water quality of 1500 mg/l dissolved solids, 10 mg/l organic matter, +25°C, with a turbidity of 100 NTU and a pH of 7.8. And a cleaning procedure of backwashing the filter every five liters with air was also performed. The geometric average removals exceeded 99.9999% for the bacteria, and 99.9% for the *Cryptosporidium* oocysts. These units comply with the criteria guidelines under the U.S. Environmental Protection Agency's Guide Standard and Protocol for Testing Microbiological Water Purifiers for these two groups of microbes.

Department of Soil, Water and
Environmental Science
College of Agriculture and Life Sciences

THE UNIVERSITY OF
ARIZONA
TUCSON ARIZONA

429 Shantz Building, #38
1177 E. Fourth Street
P.O. Box 210038
Tucson, AZ 85721-0038 USA
(520) 621-1646
FAX: (520) 621-1647
sw@ag.arizona.edu

INTRODUCTION

Development of the need for personal water treatment devices has evolved from consumer interest in improving and ensuring the quality of drinking water. The need also extends to the quality of untreated or partially treated waters such as that used by hikers, campers, recreational home and boat owners.

One of the major concerns in water treatment is the need to remove disease-causing microorganisms (bacteria, and protozoa) from water before its consumption, since it is recognized that infectious disease transmission by water is a significant public health concern. The majority of documented waterborne diseases in the United States are still caused by infectious microorganisms (Craun, 1986).

It is important that water treatment units or devices designed for the protection of human health be effective against pathogenic microorganisms and be capable of providing this capability over the life of the equipment and over a wide range of water conditions. This requirement is a necessary consideration for protection of the public's health by both the water industry and the government.

To ensure the efficacy of microbiological water purifiers, a multidisciplinary task force was formed by the U.S. Environmental Protection Agency to develop a guide standard and protocol for testing of such units. This guide standard and protocol appeared in the Federal Register of May 26, 1986, and has been accepted on a provisional basis by the U.S. Environmental Protection Agency's Office of Drinking Water and Office of Pesticide Programs. This document recommends test and

Department of Soil, Water and
Environmental Science
College of Agriculture and Life Sciences

THE UNIVERSITY OF
ARIZONA
TUCSON ARIZONA

429 Shantz Building, #38
1177 E. Fourth Street
P.O. Box 210038
Tucson, AZ 85721-0038 USA
(520) 621-1646
FAX: (520) 621-1647
sw@ag.arizona.edu

performance requirements for microbiological water purifiers. While the document specifically deals with testing criteria for certain types of water treatment devices such as halogen disinfects, ultraviolet light, ceramic filters, etc., its purpose was to serve as a guide for all types of water treatment devices. The guide establishes that any microbiological water purifier be capable of removing or killing enteric bacteria and protozoan parasites. Such units should be capable of reducing challenge levels of suggested microbial contaminates in each class of microorganism. The units must demonstrate at least a 99.9999% removal of Escherichia coli, and a 99.9% removal of *Giardia*. The devices must also be capable of achieving these results under a realistic "worst case" water quality situation.

To assess the performance of the units, *Giardia* cysts were replaced with *Cryptosporidium* oocysts as the test parasite. *Cryptosporidium* oocysts (3.0-5µm) are smaller than *Giardia* cysts (8.0-12µm) and more likely to pass through units, which depend upon filtration for parasite removal. *Cryptosporidium* is extremely resistant to common water disinfectants (Korich et al, 1990) and has caused several large waterborne outbreaks in the United States and Europe in recent years (Smith and Rose, 1990). Thus, any filtration unit capable of removing *Cryptosporidium* should be able to eliminate *Giardia* cysts. It was recently recommended by the FIFRA Scientific Advisory Panel Antimicrobial Subpanel, Office of Pesticide Programs, on August 24, 1993, that *Cryptosporidium* oocysts be substituted for *Giardia* cysts for testing microbiological water purifiers.

Department of Soil, Water and
Environmental Science
College of Agriculture and Life Sciences

THE UNIVERSITY OF
ARIZONA
TUCSON ARIZONA

429 Shantz Building, #38
1177 E. Fourth Street
P.O. Box 210038
Tucson, AZ 85721-0038 USA
(520) 621-1646
FAX: (520) 621-1647
sw@ag.arizona.edu

MATERIALS AND METHODS

Experimental Design

The basic experimental design for evaluating the water purification units was based on the recommendations of the U.S. Environmental Protection Agency's Task Force Report on the *Guide Standard and Protocol for Testing Microbiological Water Purifiers* (Federal Register, May 26, 1986).

Three hollow fiber LifeStraw were provided by Vestergaard-Frandsen, Ch. De Messidor, 5-7, CH-1006 Lausanne, Switzerland and operated according to the manufacturer's instructions. The units were challenged with the test microorganisms after various points of lifetime of operation. Between challenges dechlorinated (by passage of the tapwater through a column of activated carbon) University of Arizona tapwater was processed through the units and a backflushing procedure was done every five liters with the aid of a MIKASA double barrel pump (Irvine, CA). The physical/chemical characteristics of this water are shown in Table 1. The units were challenged with the microorganisms suspended in "worst case" water quality at all challenge points. For the worst case microbial challenge, the turbidity of the test water was increased to 100 NTU by addition of ISO 12103-1, A2 fine test dust (Powder Technology, inc., Burnsville, MN), 1500 mg/l dissolved solids by addition of sea salts (Sigma Chemical, St. Louis), and 10 mg/l humic acid (Aldrich, Milwaukee, WI).

Department of Soil, Water and
Environmental Science
College of Agriculture and Life Sciences

THE UNIVERSITY OF
ARIZONA.
TUCSON ARIZONA

429 Shantz Building, #38
1177 E. Fourth Street
P.O. Box 210038
Tucson, AZ 85721-0038 USA
(520) 621-1646
FAX: (520) 621-1647
sw@ag.arizona.edu

Bacterial Analysis

Escherichia coli (ATCC-25922)) was grown overnight in Trypticase Soy broth (Difco, Detroit, MI) at 37°C to obtain the organisms in the stationary growth phase. The bacterial cells were pelleted by centrifugation and resuspended in phosphate buffered saline. This procedure was repeated three times to remove organic matter present in the broth.

Bacterial assays were conducted by the membrane filtration method on m-Endo Agar LES (Becton Dickinson and Cockeysville, MD. Cat# 4311203). Appropriate dilutions of influent samples were made in sterile 0.025 M phosphate buffered saline (PBS) at pH 7.0. A 100 mL sample of undiluted unit effluent was also assayed.

Cryptosporidium Assay

Cryptosporidium oocysts were obtained from feces of infected calves and purified by a discontinuous sucrose gradient procedure (Arrowood and Sterling, 1987). Unit influent (10 mL) and effluent (100 mL) were collected separately. They were centrifuged in an IEC Clinical Centrifuge (Nedhan Hts, MA) at 400 x g for 15 minutes to pellet the oocysts. The supernatant was aspirated to one mL above the pellet. After resuspension of the pellet in phosphate base buffer, the oocysts were counted using a Spotlite hemocytometer (Baxter Healthcare Corp. McGraw Park, IL) using a phase microscopy (BH Olympus, Japan) at 400x magnification. At least 12 chamber aliquots were counted for each sample according to the procedure outlined in the Guidance Manual (USEPA, 1990). The average of the total counts of oocysts were divide it by 9

Department of Soil, Water and
Environmental Science
College of Agriculture and Life Sciences

THE UNIVERSITY OF
ARIZONA.
TUCSON ARIZONA

429 Shantz Building, #38
1177 E. Fourth Street
P.O. Box 210038
Tucson, AZ 85721-0038 USA
(520) 621-1646
FAX: (520) 621-1647
sw@ag.arizona.edu

(number of squares counted under each chamber of hemocytometer) and this number was multiplied by $1.0x10^4$ to obtain the number of oocysts per mL in the concentrate. The total number of oocysts was divided by 10 in the case of influent samples and by 100 for effluent to determine the number of oocysts per mL of the test water before and after passage through the unit.

RESULTS

The results of microbial removals are shown in Tables 2 through 4. These results show that the units achieved the required geometric average removal of 7.3 $\log_{10}$ for *Escherichia coli* (USEPA requires 6 $\log_{10}$), and 3.9 $\log_{10}$ for *Cryptosporidium* oocysts at all test points (USEPA requires 3 $\log_{10}$).

Turbidity was removed during the challenges by 99.6% in average.

Flow-rates varied as follows in average:

- 280mL/min at the beginning
- 280mL/min between 10 and 200L
- 250mL/min between 200 and 500L
- 170mL/min between 500 and 1000L
- 111mL/min between 1000 and 1525L

Between 0 and 1000L the average flow-rate was 200mL/min

In summary, the Vestergaard-Frandsen hollow fiber LifeStraw met the microbial removal requirement of the U.S. Environmental Protection Agency's *Guide Standard and Protocol for Testing Microbiological Water Purifiers* for bacteria and parasites.

Department of Soil, Water and
Environmental Science
College of Agriculture and Life Sciences

THE UNIVERSITY OF
ARIZONA.
TUCSON ARIZONA

429 Shantz Building, #38
1177 E. Fourth Street
P.O. Box 210038
Tucson, AZ 85721-0038 USA
(520) 621-1646
FAX: (520) 621-1647
sw@ag.arizona.edu

REFERENCES

American Public Health Association. 1998. Standard Methods for the Examination of Water and Wastewater, 20th ed. Washington, DC.

Arrowood, M.J. and C.R. Sterling. 1987. Isolation of *Cryptosporidium* oocysts and sporozoites using discontinuous sucrose and isopycnic percoll gradients. J. Parasitology 73:314-319.

Craun, G.F. 1986. Waterborne Diseases in the United States, CRC Press, Boca Raton, FL.

Korich, D.G., J.R. Mead, M.S. Madore, N.A. Sinclair, and C.R. Sterling. 1990. Effects of ozone, chlorine dioxide, chlorine, and monochloramine on *Cryptosporidium parvum* oocyst viability. Appl. Environ. Microbiol. 56:1423-1428.

Smith, H.V. and J.B. Rose. 1990. Waterborne cryptosporidiosis. Parasitol. Today. 6:8-12.

USEPA. United States Environmental Protection Agency. 1987. Pesticide Program Guide Standard and Protocol for Microbiological Water Purifiers. Federal Register, Vol 51, No. 133, Thursday; May 26.

USEPA. United States Environmental Protection Agency. 1990. Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems using Surface Water Sources. Washington, D.C.

Table 1. Test Waters Used in Microbiological Challenges

Aging Test Water 25 °C	
Turbidity (NTU)	15
pH	7.8
Total Dissolved Solids (mg/l)	450
Total Organic Carbon (mg/l)	5
"Worse Case" Challenge Water 25 °C	
Turbidity (NTU)	100
pH	7.8
Total Dissolved Solids (mg/l)	1500
Total Organic Carbon (mg/l)	10

Table 2. Removal of *Escherichia coli*
Results are given as colony forming unit per liter

CHALLENGE POINT	LITERS	INFLUENT	UNIT 1 EFFLUENT	UNIT 2 EFFLUENT	UNIT 3 EFFLUENT	LOG REDUCTION	PERCENT REDUCTION
0	0	1.69E8	<10	<10	<10	>7.23	>99.999995
15	250	1.20E8	<10	<10	<10	>7.08	>99.999992
30	500	2.00E8	<10	<10	<10	>7.30	>99.999995
37	600	1.45e8	<10	<10	<10	>7.16	>99.999993
46	750	2.50e8	<10	<10	<10	>7.40	>99.999996
55	900	1.02e8	<10	<10	<10	>7.01	>99.99999
61	1000	1.40e8	<10	<10	<10	>7.15	>99.999993
70	1150	2.70e8	<10	<10	<10	>7.43	>99.999996
76	1250	3.50e8	<10	<10	<10	>7.54	>99.999997
89	1450	2.10e8	<10	<10	<10	>7.32	>99.999995
92	1500	1.56e8	<10	<10	<10	>7.19	>99.999993
96	1575	5.00e8	<10	<10	<10	>7.70	>99.999998
100	1625	7.00e8	<10	<10	<10	>7.84	>99.999998

Table 3.Removal of *Cryptosporidium* oocysts
Results are given as oocysts per liter

CHALLENGE POINT	LITERS	INFLUENT	UNIT 1 EFFLUENT	UNIT 2 EFFLUENT	UNIT 3 EFFLUENT	LOG REDUCTION	PERCENT REDUCTION
0	0	5.42e6	6.94e2	<6.94e2	<6.94e2	>3.89	>99.98
15	250	6.25e6	<6.94e2	<6.94e2	<6.94e2	>3.95	>99.98
30	500	5.00e6	<6.94e2	<6.94e2	<6.94e2	>3.86	>99.98
37	600	5.75e6	<6.94e2	<6.94e2	<6.94e2	>3.92	>99.98
46	750	6.58e6	<6.94e2	<6.94e2	<6.94e2	>3.98	>99.98
55	900	5.91e6	<6.94e2	<6.94e2	<6.94e2	>3.93	>99.98
61	1000	5.58e6	<6.94e2	<6.94e2	<6.94e2	>3.91	>99.98
70	1150	6.00e6	<6.94e2	<6.94e2	<6.94e2	>3.94	>99.98
76	1250	5.54e6	<6.94e2	<6.94e2	<6.94e2	>3.90	>99.98
89	1450	5.60e6	<6.94e2	<6.94e2	<6.94e2	>3.91	>99.98
92	1500	6.10e6	<6.94e2	<6.94e2	<6.94e2	>3.94	>99.98
96	1575	5.80e6	<6.94e2	<6.94e2	<6.94e2	>3.92	>99.98
100	1625	6.90e6	<6.94e2	<6.94e2	<6.94e2	>3.99	>99.98

Table 4 Over All Percent and Log Reduction

Microorganism	Log Reduction	Percent Reduction
Escherichia coli	>7.33	>99.999995
Cryptosporidium oocysts	>3.93	>99.98

Table 5. Flow Rate
Milliliters per minute
Cleaning Procedure every 5 liters

Challenge points in liters	Flow Rate
0	280
10 to 100	280
200 to 500	250
500 to 1000	170
1000 to 1525	111

Table 6. Average Turbidity Removal.
Results are given as NTU

Influent	104
Effluent	0.4

AQUADIAGNOSTICS

Water Research & Technology Centre

RECOGNISED BY WATER QUALITY ASSOCIATION - USA, NABL ACCREDITED LABORATORY

TEST REPORT

Report No: AWRTCL/ PRTR/ 9348 B / 15 -16 **Date: 12.01.2106**

Customer details	Sample details	
Name & Address : **Mr.Neeraj Dogra** **M/s Lifestraw India Pvt Ltd.**	**Sample received: 02.01.2016**	**Method:** **NSF Protocol P248 Emergency Military Operations Microbiological Water Purifiers Dec 2008.**
	Sample code no:- AWRTCL/9348 B /15-16	
	Sample Description : Lifestraw Personal Water Filter	
	No. of Samples Testing : 1 No	
	Submitted By : M/s Lifestraw India Pvt Limited.	
	Date of Analysis Started : 11.01.2016	
	Date of Analysis Completed : 12.01.2016	
	Subcontract : NA	
	Condition of Sample when received: Intact.	

TEST DATA : FLOW RATE OF FILTRATION – 860 ml/min.

TEST ORGANISM	INPUT WATER COUNTS	OUTPUT WATER COUNTS	% REDUCTION	NSF P 248 Requirement
E.Coli MTCC - 68	$3x10^5$ cfu/ml	No viable count / 100 ml	>99.9999%	99.9999
3 micron Microspheres (artificial cysts)	1.11X 10^7/Lit	<160 / Liter	>99.99	99.9

Cfu: Colony forming units , <160/Liter = Below detection Limit

INFERENCE : Tested unit of Lifestraw Personal Water Filter is effective in removing Bacterial and Cyst contaminants in compliance with NSF P248 protocol. Output water was crystal clear by reduction of Input water Turbidity from 37 NTU to <0.5 NTU.

Methodology of Testing :

WATER FILTRATION :

Test set up was made as shown in the picture (next page) Initially DM water was filled in the 2 Liter Glass beaker containing Life straw personal Water filter. Then vacuum pump was connected to the outlet of the filter through a Vacuum Flask (sterilized). Water filtration was done for 2 Liters. Then test water was filled in the beaker and filtration was carried out for 2 Liters. Then spiked water (E.Coli and 3 micron microspheres together) was filtered for 2 Liters. Then again 2 liters of spiked water was filtered and samples of Input & filtered water were collected during the 4_{th} set of filtration including flushing.

ANALYSIS:

E.Coli was enumerated with Membrane filtration technique on M Endo agar. Incubation was carried out for 24 hrs at 37^0C. Microspheres were counted on Heamocytometer coupled with Light Microscope.

Dr S.MURALIDHARA RAO
Head – Laboratory

WE UNDER TAKE ANALYTICAL JOBS FOR WATER, FOOD, BIOCIDAL RESINS, DETERGENTS & SANITIZERS AND SOIL. WE CARRY OUT PERFORMANCE EVALUATION OF DRINKING WATER TREATMENT UNITS AS PER NSF/ANSI SPECIFICATIONS. BASED ON PERFORMANCE WE CAN ARRANGE FOR GOLD SEAL CERTIFICATION FROM WQA - USA

Note:

1. The Results pertain only to the tested samples and applicable parameters.
2. Samples will be disposed after 15 days from the issue of test certificate unless otherwise specified, Incase of bacteriological tests, the samples will be disposed after 7 days itself from the date of issuing the certificate.
3. This report is not to be reproduced either wholly or in parts and cannot be used as evidence in the court of Law and should not be used in any advertising media without prior written permission.
4. In case, any reconfirmation of contents of this certificate is required please contact our office.

Mailing Address:

AQUADIAGNOSTICS WATER RESEARCH & TECHNOLOGY CENTRE LIMITED.

No. 57, Om shakthi Complex, 1st Floor, G.B. Palya, Hosur Main Road, Bangalore - 560 068. INDIA. Tel: +91 - 80 - 25731142/81, Fax: +91 - 80 - 25731173.

email: smr@aquadiagnostics.com, aquadiagnostics@gmail.com, website: www.aquadiagnostics.com

TEST SETUP

TEST WATER CHARACTERISTICS :

Test Characteristic	Concentration in the test water	
	Recommended by NSF P248	MAINATAINED DURING TEST
Chlorine mg/L	<0.1	<0.05
pH	9.0±0.2	9.10
TOC mg/L	10 – 15 mg/L	10.0
TDS mg/L	1500 ± 300 mg/	1530
Temperature ^{0}C	4.0 .2 ± 1 ^{0}C	4
Turbidity NTU	30 – 50 mg/L	37.0
Alkalinity as CaCO3 mg/L	100±20 mg/L	112.0

Adjusting test water characteristics, DM water was used by adding $MgSO_4$,$CaCl_2$,Na_2HCO3 and NaCl salts. TOC was generated by Sodium salt of Humic Acid. Turbidity was generated by A2 dust.

Dr S.MURALIDHARA RAO
Head – Laboratory

WE UNDER TAKE ANALYTICAL JOBS FOR WATER, FOOD, BIOCIDAL RESINS, DETERGENTS & SANITIZERS AND SOIL. WE CARRY OUT PERFORMANCE EVALUATION OF DRINKING WATER TREATMENT UNITS AS PER NSF/ANSI SPECIFICATIONS. BASED ON PERFORMANCE WE CAN ARRANGE FOR GOLD SEAL CERTIFICATION FROM WQA - USA

Note:

1. The Results pertain only to the tested samples and applicable parameters.
2. Samples will be disposed after 15 days from the issue of test certificate unless otherwise specified, Incase of bacteriological tests, the samples will be disposed after 7 days itself from the date of issuing the certificate.
3. This report is not to be reproduced either wholly or in parts and cannot be used as evidence in the court of Law and should not be used in any advertising media without prior written permission.
4. In case, any reconfirmation of contents of this certificate is required please contact our office.

Mailing Address:

AQUADIAGNOSTICS WATER RESEARCH & TECHNOLOGY CENTRE LIMITED.

No. 57, Om shakthi Complex, 1st Floor, G.B. Palya, Hosur Main Road, Bangalore - 560 068. INDIA. Tel: +91 - 80 - 25731142/81, Fax: +91 - 80 - 25731173.
email: smr@aquadiagnostics.com, aquadiagnostics@gmail.com, website: www.aquadiagnostics.com

LifeStraw

Regulatory compliance

Supplier / Manufacturer
LifeStraw S.A. Chemin de Messidor 5 – 7, CH – 1006, Lausanne, Switzerland.

Date of issue: **Validity**: 2 years after date of issue

Declaration of Compliance

We hereby confirm that our product

LifeStraw® Hollow Fibre – Handheld microbiological water filter

Complies with the legal regulations laid down in the European Plastic Regulation (EU) No. 10/2011 as well as in Regulation (EC) No. 1935/2004, both as amended.

When used as specified, the overall migration as well as the specific migration does not exceed the legal limits. The testing was performed according to Regulation (EU) No. 10/2011 (Annex V).

The materials and raw materials used comply with Plastic Regulation (EU) No. 10/2011; the following substances subject to limitations and/or specification have been used in the above mentioned product.

Name of Substance	Restriction
Ethylene – Ref. No. 16950; CAS No. 74-85-1	-
Acrylonitrile – Ref. No. 12100; CAS 107-13-1	SML – ND
Butadiene – Ref. No. 13630; CAS No. 106-99-0	SML – ND Restrictions 1 mg/kg
Styrene – Ref. No. 24610; CAS No. 100-42-5	-
2,4 – Toulene Diisocyanate – Ref. No. 25210; CAS No. 584-84-9	1 mg/kg in final product as isocyanate moiety
Diphenylemethane-4,4'- Diisocyanate – Ref. No. 16630; CAS No. 101-68-8)	1 mg/kg in final product as isocyanate moiety
4,4'-dichlorodiphenyl sulphone – Ref. No. 15610; CAS No.80-07-9	SML – 0.05 mg/kg
2,2-bis(4-hydroxyphenyl) propane – Ref. 13480; CAS No. 80-05-7	SML – 0.6 mg/kg

Specification of the intended use or restrictions:

- Type of types of food or processes for which the material is suitable:
  - Water
- Type or types of food or processes for which the material is not suitable:
  - Not suitable for other liquid items
- Test conditions: Simulant B (3% HAc i.e. Acetic Acid) 10 days 40°C
- Ratio of food contact surface area to volume used to determine the compliance of the material or article
- Surface to volume ratio = 6 dm^2/kg food

Traceability of the product is ensured according to Regulation (EC) No 01935/2007 via the number of the roll in conjunction with the date of production.

This declaration is valid for the product described and delivered by us. The verification of compliance was performed based on the rules set out in Regulation (EU) No 10/2011; according to which the product complies with the legal requirements subject to adherence to the stated conditions for the contact with food. In case of deviating food contact conditions, it is up to the user to verify the suitability.

Place / Date:

Lausanne, 27/09/2013

Signature:

LifeStraw S.A.
Chemin de Messidor 5–7
CH–1006 Lausanne
Switzerland