

RMB & Associates

(RMB SECURITY SERVICES)



LifeStraw[®]

From surface water to drinking water

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Safe water interventions, critical to support Military Operations worldwide.

LifeStraw® has the potential to offer relief from waterborne diseases such as typhoid, cholera, bacillary dysentery and diarrhoea.

LifeStraw® allows clean water to be accessed anywhere that water sources are available.

Prior to LifeStraw® obtaining supplies of clean safe drinking water relied on water purification tablets or the carriage of large quantities of prepared clean drinking water.

In many circumstances, this often is an unrealistic solution due to either the compliance aspects of purification tablets, or due to the operational constraints of carrying large quantities of water..

We believe that 'LifeStraw® should be a key part of a soldiers basic personal equipment' giving them access to drinkable water in operational arenas thereby extending operational capability.

LifeStraw® personal – Specifications

Name	LifeStraw® personal.
Description	Portable water purifier.
Composition	Outer shell made of high impact polystyrene, String to hang around the neck Halogenated resin, Elutes active halogen into influent water for inactivation of bacteria.
Active Ingredients	Strong base anion exchange resin, Adsorbs negatively-charged halogen residuals. Granular activated carbon (silver-impregnated) Adsorbs residual active halogen
Efficacy	Effective against waterborne bacteria and viruses
Safety	Residual iodine levels: non-existent/ within WHO limits Residual silver levels: below WHO guideline value and the US EPA MCL of 100 ppb
Filters	2 stage particle filtration – filters particles from 125 micron down to minimal 27 micron
Size	31 cm long, 2.9 cm in diameter
Weight	140 grams (dry), 160 grams (wet)

Clinical Trials

LifeStraw® Personal was tested at the University of North Carolina for microbial reduction performance. The following micro-organisms were tested.

Bacteria: *Escherichia coli* B (gram-negative bacteria indicator of faecal contamination)

Bacteria : *Enterococcus faecalis* (gram-positive bacterial indicator of faecal contamination)

Virus:MS-2 coliphage (-25nM diameter viral indicator of human enteric viruses)

Various samples of the LifeStraw® Personal were evaluated. The following table shows an overall analysis of the reduction of *E. faecalis*, *E.coli* B and MS-2 in filtered water.

Overall Log., reductions (%reductions) for each LifeStraw® Personal tested for 700 litres

LifeStraw® models	E. Faecalis	E. coli B	MS-2
1	7.3 (99.999995)	6.2 (99.99994)	1.9 (98.7)
2	7.3 (99.999995)	6.2 (99.99994)	1.9 (98.7)
3	≥7.6 (≥99.999997)	5.6 (99.99975)	1.9 (98.7)
4	7.3 (99.999995)	≥6.2 (≥99.99994)	1.9 (98.4)
5	7.0 (99.999990)	≥6.4 (≥99.99996)	1.9 (98.7)
6	7.0 (99.999990)	≥6.4 (≥99.99996)	1.9 (98.7)

Conclusion

"The LifeStraw®" models tested were able to reduce bacteria such as *E. faecalis* and *E. coli* by at least 6 log., (99.9999%) and viruses by about 1.8 (99.8%) to 2.0log., (99%) over the 700 litre volume of water tested. These results indicate highly efficacious performance to meet US EPA and NSF-International requirements for bacteria reduction. Although virus reductions did not meet the US EPA and NSF- International performance requirements of 4 log., the approximately 2 log., (99%) reduction achieved is quite substantial. This magnitude of virus reduction would appreciably reduce human exposure to waterborne viruses by 99% and thereby reduce the risk of waterborne viral infections and illness:

Professor Mark D. Sobsey
University of North Carolina

LifeStraw® personal - Claims

- Portable water purifier offering relief from common diarrhoeal diseases – can be carried around for easy access to safe and clean drinking water.
- Kills and removes 99.9999% of waterborne bacteria.
- Kills and removes 99% of waterborne viruses.
- Removes particles down to 27 microns.
- Requires no electrical power or spare parts for the life time of the straw.
- Easy to mass-distribute in areas where drinking water is contaminated.



Q1. What is LifeStraw® personal?

LifeStraw® personal is a portable water purifier that effectively removes all bacteria and viruses responsible for causing common diarrhoeal diseases. LifeStraw® personal requires no electrical power or spare parts and can be carried around for easy access to safe and clean water.

Q2. What is the need for LifeStraw® personal?

LifeStraw® personal has been developed to provide an accessible, effective solution to the 'instant' need for safe water intervention.

Q3. Who can use LifeStraw® personal?

Since humans have the natural ability to suck, both adults and children above three years can use LifeStraw® personal.

Q4. How is LifeStraw® personal used??

Simply dip LifeStraw® personal into a water source and suck on it to draw the purified liquid up.

Q5. Which micro-organisms does LifeStraw® personal filter?

LifeStraw® personal effectively removes waterborne bacteria and viruses.

Q6. How does LifeStraw® personal function?

LifeStraw® personal contains a specially developed halogenated resin that kills bacteria and viruses on contact; a special chamber further increases the exposure of micro-organisms to the halogenated resin, thereby enhancing the killing effect. Micro-filters are used to remove all particles down to 15 microns. Activated carbon adsorbs residual iodine thereby improving the taste of water.

Q7. Where has LifeStraw® personal been tested?

LifeStraw® personal has been tested at the University of North Carolina, USA.

Q8. What happens if LifeStraw® personal is used beyond 700 litres or one year?

LifeStraw® personal has been tested for its efficacy beyond 700 litres and it still retains considerable efficacy on the bacteria and viruses. Therefore, drinking water beyond 700 litres does not pose any health risks.

Q9. What is the shelf life of LifeStraw® personal?

LifeStraw® personal can be stored for three years at a maximum temperature of 30 degrees. Storage at a higher temperature will not hamper the working of LifeStraw® personal but in such a case, the first few millilitres of water consumed will have an initial lower killing effect on the bacteria and viruses.

Q10. What must one do if LifeStraw® personal gets blocked?

At regular intervals, it is recommended to do 'backwashing' that can be done by blowing out some air through the LifeStraw® personal. This will clean the pre-filters of whatever sand, silt and debris that might have got deposited in the textile filters.

Q11. What effect does LifeStraw® personal have on turbid water?

LifeStraw® personal does not remove complete turbidity from water; however, it removes the bacteria and viruses as well as undissolved particles down to the finest microns. If you need to consume turbid water, use LifeStraw® personal to drink only from the surface i.e. the top layer. Excessive intake of turbid water would clog the filters and therefore regular backwashing would be required.

Q12. What effect does LifeStraw® personal have on salt water? Does it make saline water potable?

LifeStraw® personal does not make saline water potable; however, it still removes the bacteria and viruses from the salty water.

Q13. Does LifeStraw® personal filter heavy metals like arsenic, iron and fluoride?

No, the present version does not filter any of the heavy metals.

Q14. Does LifeStraw® personal remove parasites like cryptosporidium and giardia?

No, the present version does not filter any parasites.

Q15. Why have Enterococcus faecalis and Escherichia coli been chosen for testing LifeStraw® personal?

The test results for Enterococcus faecalis and Escherichia coli B can be extrapolated to other bacteria such as Vibrio cholerae, Campylobacter sp., Klebsiella and Salmonella sp., etc.

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(R M B S E C U R I T Y S E R V I C E S)



SOME OF THE ACCOLADES GIVEN TO LIFESTRAW

LifeStraw® wins the prestigious INDEX: 2005 Award

LifeStraw® wins the Well-Tech Award 2006 for Innovative Technology

TIME.com: 'Best Inventions 2005: Healthy Options'

Forbes Magazine: Ten Things That Will Change the Way We Live – LifeStraw®

Popular Science (USA): The LifeStraw – the invention of the century?

Reader's Digest: LifeStraw® is "Europe's Best Invention"

Esquire Magazine (USA): Innovations of the Year – LifeStraw®

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