

LIFESAVER[®]
bottle

FOR A HOSTILE WORLD[™]

Dear user

I developed the LIFESAVER after I saw the tragic waste of life and serious problems caused by the lack of safe drinking water in the wake of the tsunami in December 2004 and then again the following year on August 29, 2005 when Hurricane Katrina hit Louisiana. I could not believe it. I really felt that something had to be done. It took a little while and some very frustrating prototypes but eventually I did it.

LIFESAVER bottle uses a highly advanced ultra filtration system, originally developed for industrial applications. LIFESAVER bottle will remove bacteria, viruses, cysts, parasites, fungi and all other microbiological waterborne pathogens. It does all this without the aid of any foul tasting chemicals like iodine or chlorine. As I pointed out to a friend one day "using chemicals to kill bacteria is not always effective and anyway all you are doing is drinking a chemical cocktail with some dead pathogens in it."

Whilst inventing LIFESAVER bottle I also invented FAILSAFE technology. In simple terms this means that when the cartridge has expired it shuts off, preventing the user from drinking contaminated water. Just change the cartridge and continue to use.

LIFESAVER bottle has been designed to help save lives supplying people with clean pathogen-free drinking water. Treated with care and respect you can expect many years of trouble-free use. Should you have any questions or concerns please feel free to contact me directly at michael@lifesaversystems.com

Michael W. Pritchard M.W.M.Soc

A handwritten signature in black ink, appearing to read 'Michael W. Pritchard', written over a horizontal line.

LIFESAVER systems
Inventor – CEO

Contents

4 Using your LIFESAVER bottle

- 4 Priming the cartridge
- 5 Drinking from the bottle
- 6 Before undertaking any trip
- 7 Instructions for routine use
- 7 Choosing your water source

8 Maintenance and Care of your LIFESAVER bottle

- 8 Front-side washing at home & in the field
- 10 Installing / changing the UF cartridge
- 12 Using the pre-filter
- 13 Replacing the activated carbon filter
- 14 Replacing the teat
- 14 Maintaining the pump
- 15 Failsafe Technology
- 15 Membrane integrity check
- 16 Long term storage

17 Frequently Asked Questions

18 Technical Information

19 Warranty



First time use

Priming the cartridge

In order to use LIFESAVER bottle you must first prime the UF cartridge.

To prime the UF cartridge:

- Ensure the cap is firmly tightened.
- Ensure that the snap-fit lid is on.
- Unscrew the base, fill with water and screw to close.
- Twist handle and pump a few times.*
- Twist pump handle to lock.
- Allow to stand for 5 minutes.
- Unscrew the base and discarded the water and refill again.
- Open the teat, pump the LIFESAVER bottle. Water will begin to flow. This water should be discarded and should not be drunk.**
- Refill and repeat the previous step 2 more times.
- Your LIFESAVER bottle is now ready to use.

You may notice the water takes a while to come through. This is normal and part of the priming process. After a 2-3 refills the water will flow freely.

IMPORTANT!

You may notice on priming the cartridge that the water contains grey/black particles. This is simply harmless carbon dust from the activated carbon filter and once the cartridge has been flushed through a couple of times, this will disappear.

Drinking from the LIFESAVER bottle

Having primed the cartridge, refill your LIFESAVER bottle and familiarise yourself with it. Practice drinking from the teat. This may sound a strange thing to say but because the water is under pressure it will flow from the teat without you having to suck. If you over pump the bottle and are not used to the flow you may get rather wet. Whilst drinking keep your lips closed around the teat.

Pushing the teat $\frac{3}{4}$ closed with your teeth will halt the flow. You can continue to close it fully with your teeth or just push it fully closed with clean hands.

Any position operation

LIFESAVER bottle has been designed to work at any angle and on any axis. This means that in effect it will work in any position. Not only are you able to drink straight from the teat but you can also fill mugs, water bottles, pans and other water storage vessels.

**Do not over pump your LIFESAVER bottle.*

It is effectively a pressurised vessel and should be handled with caution. You will discover in a very short time that only a few pumps are needed to induce water flow. If you continue to over pump the bottle, teat will open. This is a safety feature.

*** In order to maintain the quality of the membranes after manufacture a small amount of glycerine is used to coat their surface. Priming the cartridge removes the glycerine.*

IMPORTANT!

Always keep bottle cap firmly screwed on when in the field. Do not remove bottle cap unless changing the carbon filter or the LIFESAVER cartridge and then only after following instructions (see instructions below).

The bottle cap should remain tightly closed at all times. This holds the LIFESAVER cartridge firmly in place and ensures that contaminated water does not enter the clean water side of the bottle.

IMPORTANT!

After first use you must keep the membranes wet. Failure to do so will cause the nano-meter pores to close up and the system will shut down. This is not covered under your warranty and you will need to purchase another cartridge.

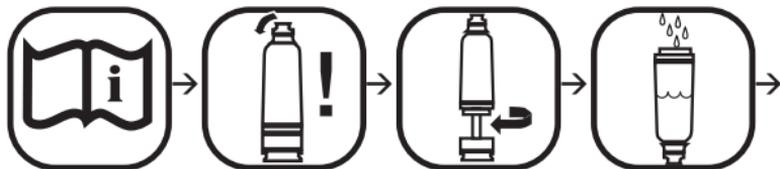
Before you undertake any trip...

It is important that you follow these few simple steps.

- Ensure that the cartridge is correctly and firmly in place. ('How to install or replace a LIFESAVER bottle UF cartridge' - page 10)
- Flush the bottle through a couple of times with clean water in order to check the flow rates.
- Check the pump is working smoothly and add a small amount of silicone grease (provided) to the piston head as required. ('Maintenance and care' - page 14) Failure to do this will result in the premature wearing of the o-ring.
- Ensure that you have installed a new activated carbon filter.
- Perform a membrane integrity check. (page 15)

Keep the membranes wet...

After first using the LIFESAVER bottle you must keep the membranes wet. When storing the LIFESAVER bottle between uses/trips you should leave a small amount of water within the bottle (25 ml or so). This will keep the membranes inside the cartridge wet and in good working order. **DO NOT** allow the membranes to dry out.



Instructions for routine use

Once you are familiar with your LIFESAVER bottle, the instructions are simple. FILL • PUMP • DRINK™

- Ensure that the drinking teat is closed and that the snap-fit lid is on securely.
- Unscrew the bottle base.
- Fill your LIFESAVER bottle with the desired amount of water.
- Screw the base back on.
- Twist to unlock the pump handle and pump a few times.*
- Twist the pump handle to lock closed.
- Open the snap-fit lid, pull teat with teeth or clean hands and drink.
- Close teat and ensure snap fit lid is firmly closed by applying pressure.

Choosing your water source

Always choose the cleanest water source available. LIFESAVER bottle will work with high turbidity water though the dirtier the water, the quicker the cartridge will expire. Using the pre-filter disc will prolong the life of your LIFESAVER bottle.

IMPORTANT!

Do not allow grit, sand or other abrasive matter to enter the bottle. If this happens it should be removed. Abrasive matter remaining in the bottle will cause the base seals to prematurely wear. This may cause your LIFESAVER bottle to leak and may void your warranty.

If the seal at the base begins to wear, applying a thin layer of silicone grease (supplied) to the inside base of the bottle will help seal the bottle and prevent leakage.

For situations where grit and other abrasive matter is difficult to avoid a separate o-ring seal may be purchased.

LIFESAVER bottles purchased after December 2007 include this O-ring as standard.

**Do not over pump your LIFESAVER bottle. It is effectively a pressurised vessel and should be handled with caution. You will discover in a very short time that only a few pumps are needed to induce water flow. If you continue to over pump the bottle, the teat will open. This is a safety feature.*



IMPORTANT!

DO NOT subject the LIFESAVER bottle/ cartridge to shock or other misuse such as inserting objects into the cartridge.

DO NOT fill the cartridge up with any liquids other than water as this may cause irreparable damage and in any event will void your warranty.

DO NOT allow large, sharp or abrasive matter such as stones, glass, metal and other detritus to enter the cartridge. The pre-filter should always be used.

DO NOT use detergents or other cleaning agents to clean your LIFESAVER bottle / cartridge except where specified.

**Maintenance and Care**

The unique ultra filtration membranes used in the LIFESAVER bottle have been developed to deliver a high volume throughput at very low pressures. The capacity of your LIFESAVER cartridge will depend on the water quality.

LIFESAVER bottle is designed to filter water only. It is not designed for filtering sugared or carbonated drinks, alcohol or any other liquids.

LIFESAVER bottle will not filter out salts.

If you suspect the cartridge has been damaged in some way always replace the cartridge immediately and wash the bottle thoroughly in a mild disinfectant. In any event perform a Membrane Integrity Check (page 15)

LIFESAVER bottle has a long shelf life. It can be stored unused for up to 3 years. Once the bottle has been used, the cartridge will last up to a further 2 years dependent upon usage conditions. Please check the end of shelf life date on your product.

Front-side washing LIFESAVER bottle

Over the life of the membranes particulate matter will build up on its surface. The filter cartridge's unique design induces particulate matter to form a caking layer on its external surfaces. To reduce this build-up you should perform a front-side wash on a regular basis.

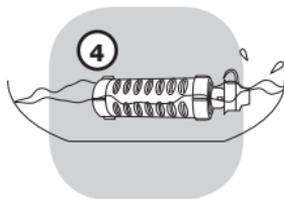
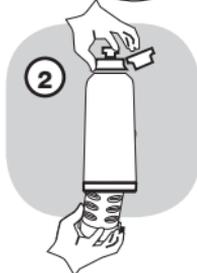
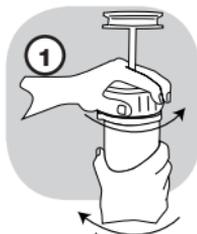
To perform a front-side wash:

In the field

With the snap-fit lid on, remove the base and remembering to use the pre-filter, gently flush the bottle with water. This flush water can be from a river, stream or puddle. This will help remove dirt and debris from the bottle and surface of the membranes and ease the flow of water. This process may be performed again and again as and when necessary. It is always a good idea to keep the membranes as free from particulate matter as possible.

At home

1. Empty the bottle of water. Empty the teat end of water.
2. Unscrew & remove the base ①
3. Place your hand over the base to support the cartridge.
4. Keeping the bottle in the vertical position unscrew the cap. The cartridge will drop into your hand. ②
5. Screw the cap onto the cartridge and replace the snap-fit lid. ③ (THIS IS VERY IMPORTANT as it prevents contaminated water from entering the clean water area within the cartridge. If you fail to do this you risk contaminating the safe water area of the cartridge and the cartridge may need to be replaced.)
6. It is now safe to soak the cartridge in a basin of water. By gently agitating the water, dirt and other matter will be dislodged from the surface of the membranes. ④
7. Flush this water away and repeat several times as necessary.
8. Leave the cartridge to drain for 24 hours.
9. To re-assemble. Insert the cartridge into the LIFESAVER bottle ensuring that the neck of the cartridge sits inside the neck of the LIFESAVER bottle.
10. Gently twist the cartridge until you feel the cartridge engage in the locators in the neck of the bottle. Holding the cartridge in place with one hand, screw the cap seal on. (see long term storage - page 16)



IMPORTANT!

The cap must be firmly closed but be careful not to over tighten.

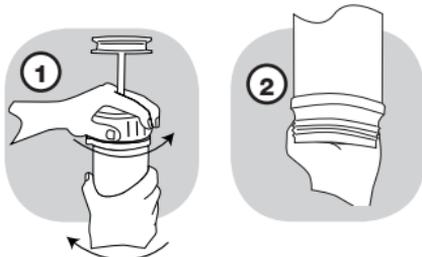
IMPORTANT!

Changing your LIFESAVER cartridge in the field causes a heightened risk of cross contamination during cartridge change over. Should you need to replace your cartridge, ensure you have clean, dry hands. Once the expired cartridge is removed, clean, disinfect and dry the bottle before inserting the new cartridge. This will reduce the risk of cross contamination.

How to install or change a LIFESAVER bottle UF cartridge

Before changing your cartridge, try front-side washing first to remove particulate matter (page 8). This may just extend the life of your cartridge long enough to meet your requirements.

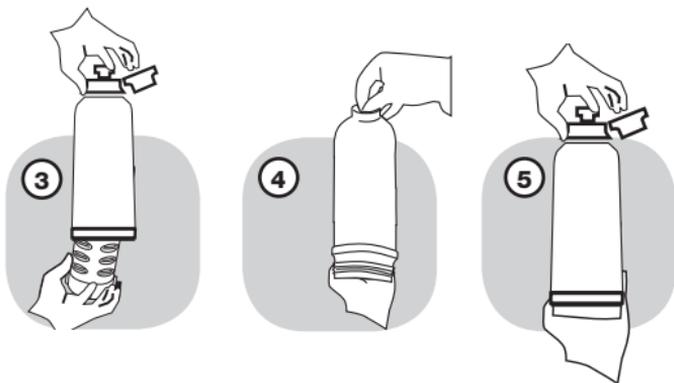
As the LIFESAVER cartridge has been designed for exceptional service life, it is rare that you will need to change the cartridge whilst in the field. However, should it be necessary, it is very important that you follow the instructions carefully:



- Empty the bottle of water. Empty the teat end of water.
- Unscrew & remove the base ①
- Place your hand over the base to support the cartridge*. ②
- Keeping the bottle in the vertical position unscrew the cap. The cartridge will drop into your hand. ③
- Thoroughly clean the LIFESAVER bottle by washing it with mild washing up liquid in warm water. Use a soft cloth for this. Ensure that all dirt is removed and the bottle is thoroughly clean. Rinse thoroughly and allow to dry.
- Remove the new LIFESAVER cartridge from it's packaging.

- Insert the new cartridge into the bottle and twist until it engages correctly.
- Whilst holding the cartridge in place inside the bottle with one hand, remove the safety seal from the cartridge with the other hand. ④
- Whilst holding the cartridge firmly in place screw the cap firmly back in place ⑤
- Close the snap-fit lid.
- Screw up the base.

Your LIFESAVER bottle is now ready to use





Using your pre-filter disc

Your LIFESAVER bottle comes with a pre-filter disc already fitted inside.

Your Pre-filter disc is designed to extend the life of your LIFESAVER bottle.

Your pre-filter disc may also be used as a sponge. Use it to soak up water from those hard to reach places like cracks in rocks or shallow puddles. Simply squeeze the contents of the sponge into the bottle.



When the pre-filter disc has collected muck, dirt, sand and other debris these should be washed free from the pre-filter disc before re-inserting.

If the hole is taking a while to close-up simply remove the pre-filter disc, place in water and squeeze it a couple of times.

You may find that when using the pre-filter disc that water can take some time to enter the bottle. If the pre-filter disc is dry you can improve the flow rate by immersing it in the water source and squeezing it a few times.



Over time the pre-filter disc will become worn. It should be replaced if it becomes torn. In any event it should be replaced every 6-12 months dependent on use.

IMPORTANT!

The pre-filter must always remain in the bottle.

Replacing your activated carbon filter

The activated carbon filter is made of high specification activated carbon which reduces a broad spectrum of chemical residues including pesticides, endocrine disrupting compounds, medical residues and heavy metals.

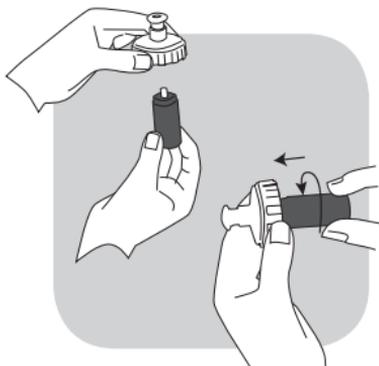
It is designed to last for approximately 250 litres.

1. Empty LIFESAVER bottle of water.
2. Install pre-filter disc in base of bottle and firmly screw up base.
3. Pump the handle 30 times.*
4. Unscrew the cap.
5. Unscrew the old activated carbon filter and replace with a new one.
6. Firmly screw up the cap.
7. You may now slowly unscrew the base.
8. If this proves difficult leave the teat in the open position for a few minutes and try again.

After any trip and or when storing LIFESAVER bottle the activated carbon filter should be removed and discarded. Only replace with a new one immediately before your next trip.

IMPORTANT!

If you do not pump the handle 30 times the cartridge will disengage from the seal and you risk contaminating the clean water side of the bottle.

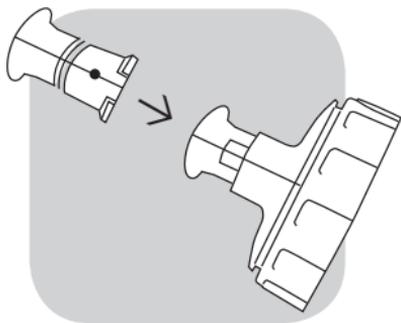


Do not over tighten the activated carbon filter as this risks damage

IMPORTANT!

Do not replace your carbon filter in the field unless absolutely necessary. When replacing the carbon filter you must follow these instructions. Failure to do so may cause contaminated water to pass through to the drinking water side.

Leaving the activated carbon filter inside the bottle whilst in long term storage may cause microbiological growth to occur. This will not have come from the bottle but may come from the user's saliva. Always remove and discard the activated carbon filter when storing LIFESAVER bottle long term.

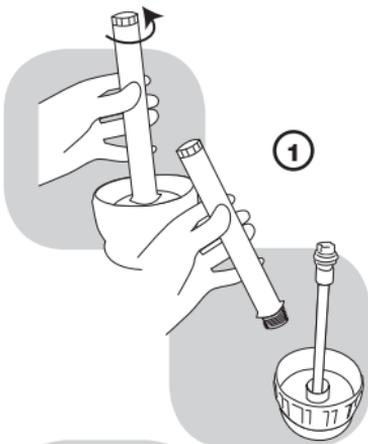


Replacing the teat

LIFESAVER bottle's teat has been designed to be non-tasting, replaceable and chew-proof. Unlike many other systems LIFESAVER bottle has been designed so that its teat can be easily changed.

Over time the teat will wear. When it becomes necessary to replace follow these instructions.

1. Open the snap-fit lid.
2. Pull out the teat.
3. Remove your new teat from its packaging.
4. Wet the teat.
5. Align the position dot on the teat with the seam on the cap and firmly insert.



Maintaining the pump

LIFESAVER bottle's pump has been designed for high workloads. The o-ring inside the pump is designed to glide easily up and down the tube. A small amount of silicone grease (provided) should be added to the o-ring of the pump plunger from time to time.

To maintain the pump follow these instructions.

1. Unscrew the base.
2. Hold the base in one hand and with the other hand unscrew the pump anti-clockwise. ①
3. Place a small amount of silicone grease around the o-ring. ②
4. Reassemble taking care not to over tighten.

FAILSAFE™ technology

There are several aspects of this technology that increase the safety and reliability of your LIFESAVER bottle.

Auto Shut Off

As the LIFESAVER cartridge nears the end of its service life a greater and greater number of pumps are required to induce water to flow. There will come a point at which despite continuous pumping water does not flow. This is the auto shut off feature of FAILSAFE working. Your cartridge has now expired and you must now change it. Before changing however, perform a front side wash as the membranes may just be covered with particulate matter.

Membrane Integrity

The ultra filtration membranes used in your LIFESAVER bottle have been precision engineered. They have been integrated into a robust cartridge format and have been designed for long service life. If treated incorrectly they are liable to break. There are several reasons why a membrane might break. DO NOT subject the bottle/cartridge to shock or other misuse such as inserting objects into the cartridge or filling the cartridge up with anything other than water. DO NOT allow large, sharp or abrasive matter such as stones, glass, metal etc. to enter the cartridge.

IMPORTANT!

This integrity check should be performed on a regular basis and every time the bottle has been subjected to shock or you suspect damage may have occurred for any reason to the bottle or cartridge membranes.

Membrane Integrity check

Your LIFESAVER bottle has been designed to work at any angle and on any axis. If water does not flow at all angles and axes then you have damaged the membranes in some way and you must replace the cartridge immediately.

Long term storage

If storing your LIFESAVER bottle for a prolonged period of time (i.e. between trips) you should always perform a front-side wash. Ensure that no water remains in the teat end of the cartridge. You will need to discard the activated carbon filter and the pre-filter disc. Also see '**Keep the membranes wet**' on page 6.

Sterilisation

Fill a jug or similar vessel with 1 litre of tap water and add 3ml of Milton Fluid (or compatible sterilising fluid) to make a sterilising solution. Fill the LIFESAVER bottle with the sterilising solution to the top of the cartridge fins and screw base back on. Gently agitate. Leave for 1 hour. Invert and leave for a further 1 hour. Now pump the sterilising solution through the bottle and discard to drain.

Refill the LIFESAVER bottle with fresh tap water and pump through to drain. Dis-assemble the bottle and remove the cartridge. Remove the cap and remove the teat from the cap. Clean all parts except the cartridge itself. You may use a mild washing-up liquid. Dry thoroughly and then reassemble the bottle.

Unscrew the base and add a small amount of tap water (25 ml or so) to the bottle. This is very important as it keeps the membranes in good working order. (See '**Keep the membranes wet**' on page 6). Screw the base back on again and store away from sunlight.

When you plan to use LIFESAVER bottle again just flush the bottle through twice and it is ready to use.

If you notice any bacteriological growth on the inside of the bottle then clean both bottle and cartridge as advised, (page 8) and perform sterilisation again.

Before first use LIFESAVER bottle should be kept in a dry place. After first use the product should be protected against freezing.

Frequently asked questions

Q. I am finding it difficult to unscrew the base

- A. If you find it difficult to remove the base, this could be due to an over pressurisation. To solve this, leave the teat in the open position for a while and try again. Alternatively you may have over tightened the base. This will require either access to hot water which will help loosen the base or good old fashioned elbow grease.

You may also try pumping the bottle 8-10 times and try again. Sometimes this will loosen the base.

Q. Where do I purchase additional cartridges?

- A. Replacement cartridges and other LIFESAVER bottle consumables are available from the dealer where you purchased your LIFESAVER bottle.

Alternatively go to our website www.lifesaversystems.com and buy online.

Q. Where do I dispose of spent cartridges?

- A. The cartridge is made of recyclable plastic and should be disposed of at a recycling centre. If this is not possible, you can dispose of it in your normal household waste.

Q I am pumping but no water is coming out

- A. Your cartridge may have expired or may require a front-side wash (page 8).

Q The pumping action has become stiff

- A. The most likely reason for this is a lack of silicone in the pump (maintaining the pump - page 14).

Q Where can I get replacement parts?

- A. LIFESAVER bottle has been engineered so that all parts are replaceable. Please go to the dealer where you purchased your LIFESAVER bottle.

Alternatively go to our website www.lifesaversystems.com and buy online.

For a list of these and other frequently asked questions please visit our website www.lifesaversystems.com.

Performance and technical data

Minimum operating temperature	>0 °C (32 °F)
Maximum operating temperature	50 °C (122 °F)
Minimum storage temperature	-10 °C* (14 °F)
Maximum storage temperature	60 °C (140 °F)
Initial flow rate	2.5L/min@0.25 Bar ¹
Cartridge service rating	4000 litres (1056 US gallons)
MWCO	200KDa – on dextrans
Bacteria retention	>99.999995 % (log 7.5) ²
Virus retention	>99.999 % (log5) ³
Chemical reduction	Activated carbon reduces chemical residues, inc; pesticides, endocrine disrupting compounds, medical residues and heavy metals
LIFESAVER bottle US compliance	EPA - US National Primary Drinking Water Regulations under the Safe Drinking Water Act 93-523
LIFESAVER bottle UK compliance	Water Supply (Water Quality) Regulations 2000
LIFESAVER bottle EU compliance	European Drinking Water Directive Council Directive 98/83/EC
LIFESAVER bottle WHO compliance	Guidelines for Drinking-water Quality First Addendum 3rd Edition
Membrane approvals/compliances	CE, EPA, NSF, WHO, WRAS, DVGW, KIWA, KTW, LSHTM
Dry weight of bottle inc. cartridge	635 grams approx (approx 22 oz)
Bottle storage capacity	750ml (1.6 US pints)

¹ Flow rates and capacity depend on the quality of the feed water

² Tested by London School of Hygiene & Tropical Medicine using Escherichia coli NCTC 10418 in accordance with the Protocol for Microbiological Water Purifiers in accordance with US Environmental Protection Agency (EPA) guidelines.

³ Tested by London School of Hygiene & Tropical Medicine using Poliovirus Type 1 (Sabin vaccine strain) in accordance with the Protocol for Microbiological Water Purifiers in accordance with US Environmental Protection Agency (EPA) guidelines.

* After first use the product should be protected against freezing



International Limited Warranty

Thanks again for purchasing LIFESAVER bottle. If you have any questions relating to this or any other product in our range please contact us via our website where we will be more than happy to help.

LIFESAVER bottle comes with a 2 year international warranty from the date of purchase against defects in materials and workmanship. Should your LIFESAVER bottle prove defective within 2 years from the date of purchase you should return it to the retailer that you originally purchased it from. LIFESAVER systems will, at its sole discretion, repair or replace the damaged item(s).

You should ensure that you retain your proof of purchase showing the date on which you purchased your LIFESAVER bottle. Without it we are unable to offer warranty assistance. This International Limited Warranty does not affect your statutory legal rights.

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IP4 2HE
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DISCLAIMER:

The information and data contained in this document are based on our general experience and are believed to be correct. They are given in good faith and are intended to provide a guideline for the selection and use of our products. Since the conditions under which our product may be used are beyond our control, this information does not imply any guarantee of final product performance and we cannot accept any liability with respect to the use of our products. The quality of our products is guaranteed under our conditions of sale. Existing industrial property rights must be observed.

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All details given on and in this manual are believed to be correct at the time of going to press. We reserve the right to make improvements and/or modifications to the equipment herein.