KATADYN®

MAKING WATER DRINKING WATER

Katadyn Products Inc.

Safe drinking water away from home

Katadyn Products Inc.
Birkenweg 4
8304 Wallisellen | Switzerland
Tel +41 1 839 21 00 Fax +41 1 830 79 42
info@katadyn.ch | www.katadyn.ch

Content

- Blue gold
- Travel diseases
- Water contamination
- What is in the water?
- Usage of clean drinking water
- Water treatment alternatives
- Travel preparation
- Hygiene tips
- About Katadyn
- Communication

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Water everywhere but little to drink

- 97% of the world's water is salt water.
- Two thirds of the remaining 3% is frozen in the two poles.
- Only 1% is considered fresh water – most which is not safe to drink.
- Unfortunately, much of the potential drinking water available is used as industrial water and becomes polluted with chemicals and metals.

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Information from a WHO study

- 50% of all travelers are affected by travel diseases.
- 80% of all travel disease is due to contaminated water.
- Travel plans are often changed due to disease such as diarrhea.
- Ordinary travel diarrhea is usually overcome after 48 hours. Many cases also require post-treatment at home.

Microorganisms

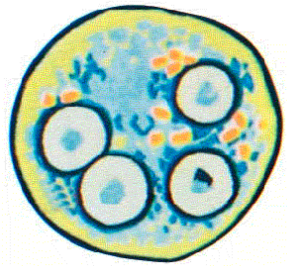
The most common health risk are pathogens like bacteria, viruses and protozoa in drinking water.

- **Bacteria (e.g. E. coli, salmonellae, cholera)**
  - Small microorganism (0.2 – 5 micron size) that get into drinking water through human and animal excrement.
  - Become hazardous as soon as they get into water

  The Solution:
  - Water microfilters can remove Bacteria from water.
  - In clear water, chemical agents can also be used to disinfect water.

Water Contamination I: Microorganisms

- **Protozoa (e.g. amoebas, giardia, cryptosporidium)**
  - Single-celled animal, which, like bacteria, gets into drinking water through human and animal excrements.
  - These hard shelled parasites form cysts which can lead to acute gastro-intestinal diseases.
  - Commonly found in unfiltered surface water, but have also been found in residential drinking water (Milwaukee, London, Sydney).
  - A single cell can cause an infection.



The Solution:

- Because of their relatively large size (1 – 15 micron), they are easily removed with water microfilters.
- Chemicals require a long contact time (2-4 hrs) due to their resistant outer shell/membrane.

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Water Contamination I: Microorganisms

- **Viruses (e.g. hepatitis A, polio)**
  - Tiny parasites from ~0.02 – 0.2 micron size.
  - Viruses can only reproduce within living cells, because they have no own metabolism.

  The Solution:
  - Since viruses are usually bound to particles in turbid water, they can often be removed with filter pores sized up to 0.2 micron.
  - For maximum safety, the filtered water should also be disinfected.

Heavy metals

- Occur naturally in the earth's crust and are spread by rain water.
- Heavy metals in larger concentrations can be very dangerous to humans.
- The WHO has published guidelines defining the maximum permissible levels in drinking water.

The Solution:

- Heavy metals can only be removed from the water using complex techniques like distillation or flocculation.
- Short-term exposure during traveling poses low health risk. Diseases are mostly caused by long-term exposure. (i.e. black-foot disease in Bangladesh caused by Arsenic)

Water Contamination III: Organic Contaminations

Agricultural substances

- Herbicides, pesticides, mineral and organic fertilizer are washed into streams, rivers and groundwater.
- These substances can occur in drinking water if the water is not treated.
- DDT was found even in mountain lakes high above agricultural zones (rain water).

The Solution:

- Most agricultural chemicals are organic and can be removed with activated carbon.

Suspended solids and turbidity

- Turbidity is caused by undissolved particles called suspended solids. These normally harmless sediments serve as nutrients for microorganisms.

The Solution:

- Usually is not a health problem but they prevent effective disinfection of the water.
- Therefore chemical disinfectant should only be used in clear water. Turbid water must be filtered first.

(Natural) mineral water

- Must originate from underground water sources and have natural purity.
- Bottled directly at the source.
- Needs an official approval.
- Natural mineral water can be offered with or without carbon dioxide.

Bottled water

- Artificially manufactured and may contain mineral, spring or tap water.
- Includes all types and qualities of water - some can be bottled and sold at any location.
- Depending on country, it must fulfill certain quality standards.
- Can be stored in canisters, barrels or hoses. Today it is usually filled in PET-bottles.
- Bottled water is not guaranteed germfree in all countries.

«Still water»

«Still water» refers to the carbon dioxide content. It contains very little or no carbon dioxide. There are three categories:

- **Natural mineral water:**
  - Bottled from a clearly defined spring.
  - Must contain a constant amount of minerals and trace elements.
- **Spring water:**
  - Must come from a certain spring.
  - Does not need to fulfill any other criteria – only purity.
- **Drinking water or table water:**
  - Artificially manufactured from mineral, spring, tap or salt water.
  - Must fulfill legal requirements but does not need a declaration of origin.
  - Depending on country, it must fulfill certain quality standards.
  - The target is to have standardized water that can be produced with the same quality in various countries.

Tap water

- Comes from ground water, surface water or springs. May be exposed to numerous environmental influences.
- Treatment with various chemicals is legally permitted.
- Traces of lead, copper and other metals can be present (usually from water pipes).
- In the tropics and subtropics, drinking tap water should be avoided.

Surface water

- A mixture of ground, spring, rain and waste water.
- Often loaded with metals and organic pollutants from industrial firms and households.
- Harmful agricultural substances is especially problematic.
- All surface water contains various bacteria, viruses and protozoa.

Test On Mountain Water

12 out of 20 samples are not consumable!

A test in the Swiss Alps revealed that 12 out of 20 samples taken in one valley, on the same day, did not fulfil the drinking water standards. It is assumed that mountain water is clear and healthy but that is not usually the case. This water proved to be contaminated by the wild-life and cattle herd excrements. In conclusion, water can be contaminated even by natural sources.

	Without Katadyn	From the total of 20 samples taken at Susten Pass, the optically worst was treated with a Katadyn Filter. The filtered sample was also examined in a lab. →	**With Katadyn**
Test date	Summer 1997		Summer 1997
Test location	Susten Pass		Susten Pass
Number of measuring points	20		1
Number of samples*	20		1
Sample quantity	100 ml		100 ml
Visible aspect	17 clear 1 turbid 2 brownish		1 brownish
Drinkable * *	8		1
Not drinkable	12		0
Coli concentration/ Authorized limit	up to 155 0		0 0
Enterokokken concentration/ Authorized limit	up to 90 0		0 0
Global bacterial concentration/ Authorized limit	up to 30000 100		0 100

** *According to the German drinking water standards (identical to the Swiss Natural sources tolerance standards)*

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Water Related Incidents I

Acute diarrhoea in summer camp

During a summer camp in the Weissentannen Valley, 30 people had acute diarrhoea. 10 of them had to be hospitalised. The cause for this group illness was determined to be a water source that had been contaminated by surface water during heavy rainfall.
Reference : Swiss Press Agency, 18. July 2001

Faecal bacteria in ground water

In the Swiss neighbourhood of Itingen, long lasting habits had to change. The water of the village well was not safe as it had always been. Reason: Faecal bacteria was present in the underground water.
Reference : Baselland Cantonal Laboratory, 10. April 2001

Torture instead of extreme tour!

Several participants of the Eco-Challenge 2000, an extreme tour on foot, boat and bicycle through the jungle, became seriously sick: Leptospirosis was the diagnostic. The symptoms were fever, diarrhoea, vomiting and red eyes. Infected animals' urine contaminated the water.
Source: www.ecochallenge.com/borneo/media – communication dated 11. September 2000

Water Related Incidents II

Bacteria in mineral water

In January 1998, the Swiss consumer magazine "K-Tipp" tested 18 mineral water samples from the Swiss, French, Italian und Dutch markets. 9 samples – from all 4 countries – exceeded the tolerance of 300 CFU/ml (CFU = Colony forming unit). The results ranged between 360 and 15400 KBE/ml. 4 of the samples even contained nitrate, ammonium, arsenic or Formaldehyde. Possible reason: Insufficient hygiene in the filling installation.
Source: "K-Tipp" from 28. January 1998

Defective water treatment plant, 104 deaths

In March 1993, in Milwaukee/USA, approximately 400'000 people were as a result of unsafe drinking water. 104 of them died. The water contained Cryptosporidium which was due to a defective water treatment plant.

Source: Centers for Disease Control, EPA, USA,1993

Water Related Incidents III

Austria : 42% of undrinkable samples

A study was conducted between 1997 and 2001 in the federal state of Salzburg. Based on samplings of 1'118 private wells and sources, it was determined that 38% of the samples were unsafe because of bacteriological reasons and 4% because of chemical reasons. In the majority of the cases the well or source was not protected from external contamination.

Source : Paragraph 16 Environment protection, Land Salzburg. Report on the campaign „Sauberes Trinkwasser: Aller klar" - 1997 to 2001. Report dated October 2001

Result

This list of cases is obviously incomplete. The over-representation of Swiss cases is on purpose, as Switzerland has a world-wide reputation for a clean and natural environment, but even their drinking water problems are no rarity.

Use Of Clean Drinking Water

When is clean drinking water absolutely necessary ?

- For Drinking
- To wash hands before eating and filling water bottles
- To wash fruits and vegetables which will not be cooked
- To brush teeth and handling contact lenses (mucous membranes)

When can questionable water be used ?

- Making tea and coffee (allow at least 5 minutes boiling time)
- Cooking (let the water boil for at least 5 minutes before adding food)
- Washing and showering (body, feet, cloth – NOT hands, if they will be in contact with drinking water or food afterwards)

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Boiling

- One of the oldest and most effective ways to disinfect water if sufficient energy is available (e.g. wood, fuel or electricity).
- Eliminates microorganisms but not chemical substances.
- At sea level, 5 minutes boiling time is sufficient. At 4000 meters altitude, 20 minutes is necessary because of the deeper boiling point.

Disinfection

- Disinfectants kill microorganisms and therefore prevent the transmission of pathogens.
- Disinfectants can be used in clear water only. Chlorine, iodine and silver are travel-suited products.

- **Chlorine**
  - Chlorine is the most commonly used substance for water treatment worldwide.
  - Chlorine is a fast disinfectant which is effective against a broad spectrum of microorganism (salmonella, cholera, hepatitis A, polio, giardia, amoebas, etc.)
  - Chlorine has no long-term effect.
  - Water treated with chlorine alone is not suitable for conservation.

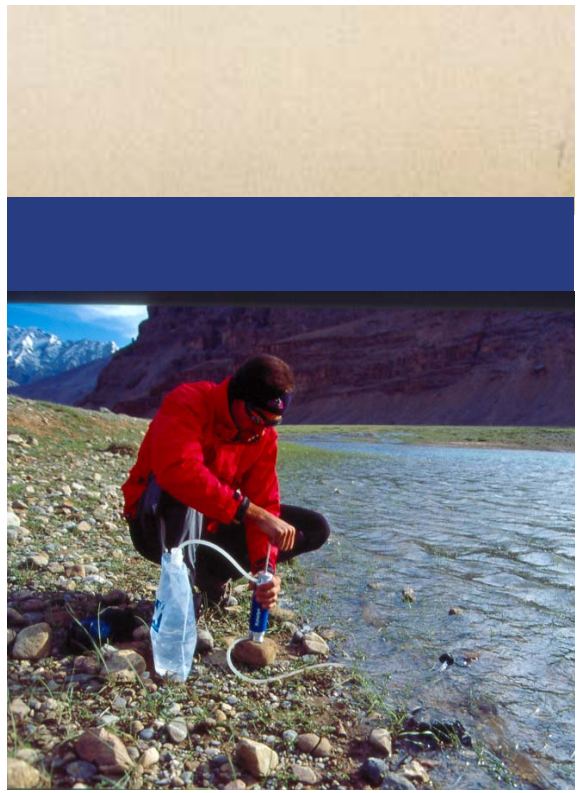
Mobile Water Treatment II: Disinfection

- **Iodine**
  - Iodine (a halogen) was first used by the British and US militaries. It is mainly available in Anglophone areas in form of tablets.
  - A significant disadvantage is that iodine leaves the water with an unpleasant taste. This can be removed with an activated carbon post-filtration.
  - Using iodine long-term can lead to a strong thyroid hyperactivity.

- **Silver**
  - Silver (or silver salt) is one of the oldest methods to inactivate bacteria.
  - Silver acts slowly but has the advantage of a very good long term effect and it prevents recontamination for up to 6 month.
  - Products based on silver are very good for storing water in caravans, on boats and for civil defense.

Microfiltration

- Microfilters mechanically remove bacteria and protozoa from water. (Chemical treatment destroys germs but they remain in the water)
- **Ceramic**
  - Ceramic filters have a micro porous structure and filter out pathogenic bacteria, protozoa and particles.
  - Katadyn ceramic are impregnated with silver which delays the growth of bacteria.
  - Katadyn ceramic filter pore size is 0.2 micron (0.0002 mm). Bacteria range in size from 0.2 to 5 micron and, like protozoa (1 – 15 micron), are efficiently filtered out.
  - Ceramic filters are easily cleaned, mechanically regenerated and the filter capacity is measurable.



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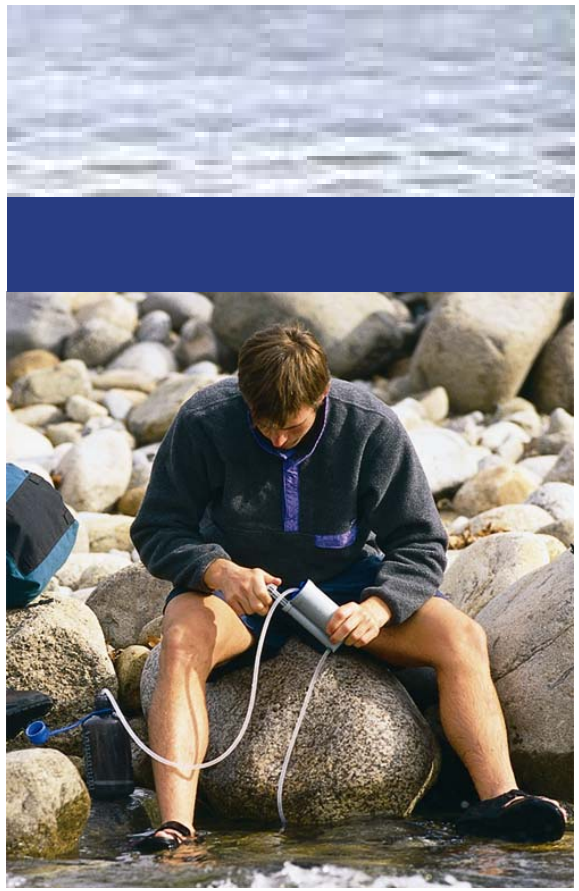
Mobile Water Treatment III: Microfiltration

- **Glassfiber**
  - Superfine glassfiber, within two supporting layers, forms a depth filter. A nominal pore size of 0.3 micron mechanically filters bacteria and protozoa.
  - The flexible glassfiber pleated design results in an extremely large surface area (less cleaning).
  - Very high capacity to absorb dirt.



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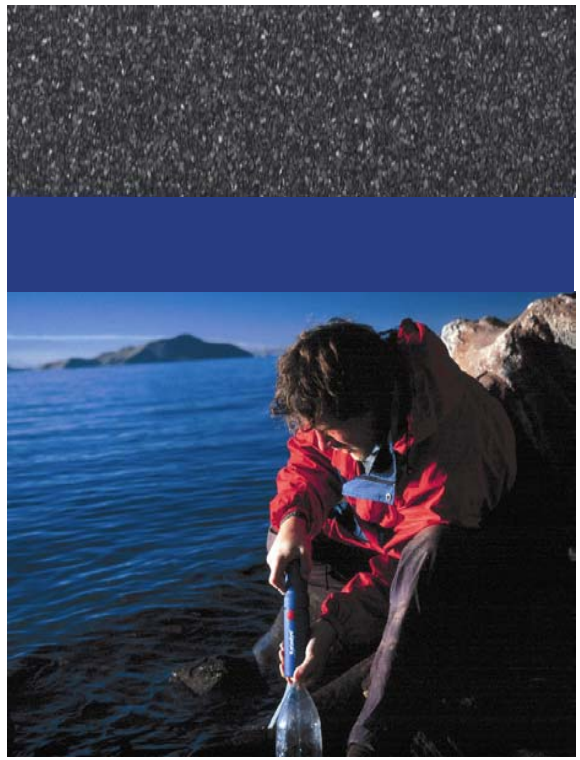
Mobile Water Treatment IV: Adsorption

- **Activated Carbon**
  - Activated carbon reduces harmful organic and inorganic substances in the water.
  - It removes unpleasant tastes, odors, chlorine, pesticides (lindane, DDT) and trihalomethanes (THMs). These substances adhere to the large surface area of the activated carbon.
  - Available in block, granular or powdered form.



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Choosing a water treatment product

- The product you choose depends on the water source
  - Is the water turbid or clear?
  - In addition to bacteria and protozoa, must viruses also be eliminated?
  - Is the water contaminated with chemicals?
  - How much water is required and how quickly must it be available?
  - If water is to be disinfected, will it be consumed directly or stored for a longer period of time?

The category system by Katadyn

Katadyn products are separated into three categories to make it easy to choose the right Katadyn product for your needs.

- **Endurance Series**

- **Backcountry Series**

- **Ultralight Series**

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Travel Preparation III

Endurance Series

- Expeditions, camps and professional use. Ultimate reliability and durability.
- Perfect for 1 – 4 persons. Also for extremely turbid water. Very high filter capacity and product life.
- **Kind of travel:** Expeditions, globe-trotters, long-haul journeys.
- **Products:** Katadyn Pocket, Katadyn Combi, Katadyn Camp, Katadyn Drip and Katadyn Expedition.

Backcountry Series

- Camping, trekking and back-packing. Great for all-around use.
- Perfect for 1 – 2 persons. For clear and slightly turbid water. From huts to camp grounds.
- **Kind of travel:** Long-haul journeys, culture and adventure trips.
- **Products**: Katadyn Hiker.

Ultralight Series

- Weekend trips, day excursions and travel. Light solo use.
- Perfect for one person. For clear water. In the outdoors or at hotels.
- **Kind of travel:** For leisure and short trips, city trips.
- **Products:** Katadyn Bottle, Katadyn Mini, Katadyn Micropur Classic and Micropur Forte

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Katadyn Pocket

The only filter with a lifetime warranty

- The most rugged microfilter on the market
- Exclusive silver impregnated ceramic cartridge
- Proven in challenging conditions worldwide
- Removes Bacteria, Giardia und Cryptosporidium

Product Specifications:

- Technology: 0.2 micron ceramic depth filter
- Output: approx. 1 l/min
- Cartridge Capacity: up to 50´000 l depending on water quality
- Weight: approx. 550 g
- Size: 24 x Ø 6 cm
- Includes: Prefilter, bottle clip and carry bag

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Katadyn Combi

The multi-functional microfilter

- The only portable outdoor water filter that converts for RVs and emergency or temporary use in homes.
- Exclusive silver impregnated ceramic cartridge
- Replaceable activated carbon reduces chemicals in water
- Removes Bacteria, Giardia and Cryptosporidium

Product Specifications:

- Technology: 0.2 micron ceramic depth filter and activated carbon
- Output: approx. 1 l/min
- Cartridge Capacity: Ceramic: up to 50'000 l depending on water quality, activated carbon: up to 400 l (2 fillings)
- Weight: approx. 580 g
- Size: 27 x Ø 6 cm
- Includes: Prefilter, bottle adaptor and carry bag

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The water filter that requires no pumping

- Simple gravity system is ideal for families and scouts
- Exclusive silver impregnated ceramic cartridge
- Siphon filter inside a 10 l water bag for large amounts of water
- Removes Bacteria, Giardia and Cryptosporidium

Product Specifications:

- Technology: 0.2 micron ceramic depth filter
- Output: approx. 5 l/h
- Cartridge Capacity: up to 20'000 l depending on water quality
- Weight: approx. 620 g
- Size: 19 x Ø 10 cm
- Hose Length: 2 m

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Katadyn Drip

Water container with built-in ceramic filters

- Ideal for groups, camps and cabins
- Exclusive silver impregnated ceramic cartridge
- Storage container for 10 litres filtered water
- Removes Bacteria, Giardia and Cryptosporidium
- Available with 3 ceramic filters for maximum capacity
- Available with 3 ceramic/carbon filters for additional chemical reduction and improvement of taste

Product Specifications:

- Technology: 0.2 micron ceramic depth filter
- Output: approx. 4 l/h
- Cartridge Capacity: Up to 150'000 l depending on water quality
- Weight: approx. 3.3 kg, Size: 25 x 45 cm
- Includes: 3 ceramic or 3 ceramic/carbon filter elements

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Katadyn Expedition

The indestructible high performance filter

- Ideal for outfitters, base camps and expeditions
- Exclusive silver impregnated ceramic cartridge
- Durable stainless steel design
- Removes Bacteria, Giardia and Cryptosporidium

Product Specifications:

- Technology: 0.2 micron ceramic depth filter
- Output: approx. 4 l/min
- Cartridge Capacity: up to 100'000 l depending on water quality
- Weight: approx. 5.2 kg
- Size: 58 x 20 cm
- Includes: Prefilter and carry bag

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Katadyn Hiker

The convenient and effective microfilter

- Lightweight backpacking water microfilter
- Removes Bacteria, Giardia and Cryptosporidium
- Easy operation - high water output
- Best selling microfilter

Product Specifications:

- Technology: AntiClogTM Technology with 0.3 micron glassfiber and activated carbon granulate
- Output: approx. 1 l/min
- Cartridge Capacity: Up to 750 l depending on water quality
- Weight: approx. 310 g
- Size: 7.6 x 16.5 x 6.1 cm
- Includes: Prefilter, bottle adapter and carry bag

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Katadyn Mini

The most compact water filter

- The lightest, most compact filter on the market
- Ideal for traveling and day hiking
- Exclusive silver impregnated ceramic cartridge
- Removes Bacteria, Giardia and Cryptosporidium

Product Specifications:

- Technology: 0.2 Micron ceramic depth filter
- Output: approx. 0.5 l/min
- Cartridge Capacity: Up to 7'000 l depending on water quality
- Weight: approx. 210 g
- Size: 8 x 18 x 5 cm
- Includes: Prefilter and carry bag

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Katadyn Bottle

The convenient drinking bottle with a water filter

- Filters water while you drink
- 3 - stage water filter removes Bacteria, Protozoa,
  Viruses and other contaminants
- Fits into standard cycle bottle holders and waist bags
- Improves taste of water through activated carbon granules

Product Specifications:

- Technology: Virustat cartridge with pentaiodide (I5) iodine and activated carbon granulate
- Output: approx. 0.2 l/min
- Cartridge Capacity: Up to 200 fillings
- Bottle Capacity: 0.6 l
- Weight: approx. 210 g (empty)
- Size: 29 x Ø 7.5 cm

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Katadyn Micropur Classic

Simple and safe water conservation

- Inactivates bacteria in water tanks and containers
- Silver ions preserve water for up to 6 month
- Fresh tasting water - no unpleasant taste - no chlorine
- Available in tablets, powder or liquid
- Use in combination with a filter in turbid water

Product Specifications:

- Technology: Silver ions
- Contact Time: 2 h
- Form: Tablets, powder or liquid
- Shelflife: Tablets and powder: 10 years, liquid: 5 years
- Application: For all water containers or tanks in boats and caravans

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Katadyn Micorpur Forte

Fast and effective water disinfection

- Disinfects clear water and destroys bacteria, amoebas and viruses
- Preserves water for up to 6 months by using silver ions
- Effective in 30 minutes
- Available in tablets, powder or liquid
- Use in combination with a filter in turbid water

Product Specifications:

- Technology: Silver ions combined with chlorine
- Contact Time: 30 min for bacteria and viruses, 2 h for Giardia in clear water
- Form: Tablets, powder or liquid
- Shelflife: Disinfection 2 – 5 years, conservation 5 years
- Application: Camping, traveling and hiking

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Katadyn Micropur Antichlor

Restores the natural taste of drinking water

- Eliminates the taste of chlorine (transforms chlorine into table salt)
- Use as a final step of Micropur Forte
- Also suitable for preparing drinks with tap water
- Available as liquid and easy to dose

Product Specifications:

- Technology: Sodium thiosulphate
- Contact Time: 3 min.
- Form: Liquid
- Shelflife: 5 years
- Application: For water with chlorine taste

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How to keep healthy while traveling

1. Order your drinks without ice if you are unsure that the ice is germ-free.
2. Drink only industrially bottled beverages. “Open” or unsealed bottles could be contaminated.
3. Order your food well-cooked. Avoid raw or lightly cooked food, seafood, mayonnaise, ice cream, butter, etc.
4. Avoid eating food from street vendors.
5. Only eat fruits, raw vegetables, or salads washed with germ-free water. Otherwise, wash them yourself with disinfected water.
6. Avoid raw milk. Pasteurized milk is safer to drink.
7. Fruit juices with high sugar content are an ideal place for bacteria to grow. Only drink juices if the fruit, blender, and hands were hygienically cleaned.

How to keep healthy while traveling

8. Fresh hot coffee and tea are safe beverages. Beer and wine are also typically safe. Note: Alcoholic beverages do not disinfect bacteria already in the stomach.
9. Brush your teeth with germ-free water. Even a small sip of contaminated water can cause diarrhea.
10. Always use germ-free water when taking medicines. Diarrhea is not only uncomfortable; it could also affect the impact of the medicine (i. e. tablets).
11. Don't bathe in tropical surface water.
12. Wash your hands regularly, especially after using the toilet and before contact with food.
13. Always use clean towels.

Making Water Drinking Water

- Swiss company located in Wallisellen near Zurich
- Global leader in portable water treatment
- Worldwide distribution network with subsidiaries in Germany, France, Singapore and the USA
- Producing high quality portable water systems since 1928
- ISO 9001/2000 certified
- All products are assembled in Switzerland

KATADYN®
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Communication I

For distributors

- Product brochures
- Product displays
- Electronic newsletter (currently only in German)

For end consumers

- Water Guide – Guidebook en-route (currently only in German)
- Advertising in travel catalogs and special interest magazines
- Media work (regular information to 210 media, intensive public relations with approx. 30 media)
- Electronic newsletter (currently only in German)
- Homepage

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Communication II

80% aller Reisekrankheiten entstehen durch verunreinigtes Wasser.
Deshalb machen Sie auf Reisen Ihr Trinkwasser am besten selbst.
Das richtige Produkt zum Mitnehmen finden Sie in Sport-
und Outdoorgeschäften oder in Apotheken und Drogerien.
Fordern Sie dazu auch unsere kostenlose Wasserfibel an unter
Telefon 01 839 21 11 oder unter www.katadyn.ch

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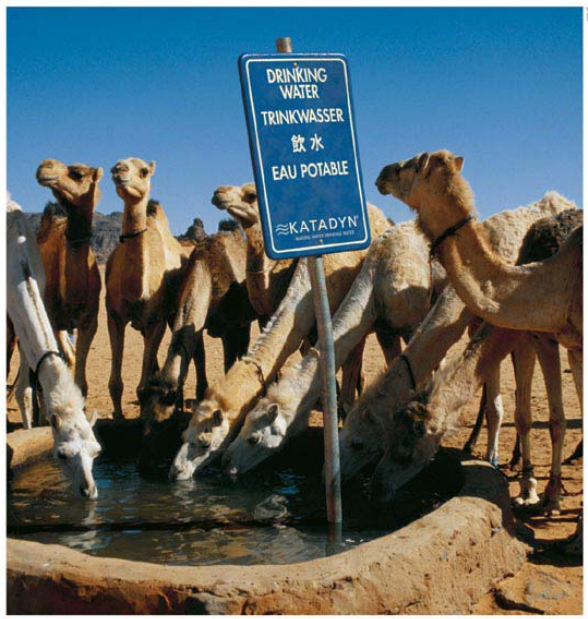

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