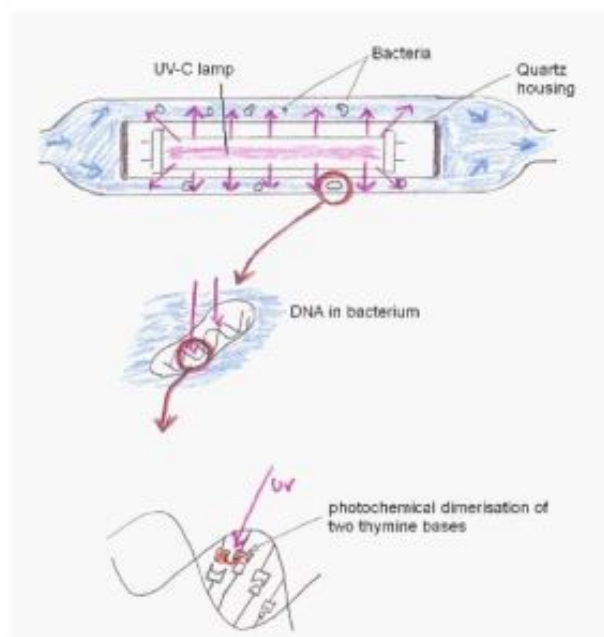


Drinking water processing recommended for local facilities and devices

- Drinking water quality is defined by parameters of WHO guides and national regulations.
- Treatment in most cases (> 90 %) has to target at germ counts, pathogenic germs, odour and taste.
- In widely most cases drinking water has not to be conditioned and stabilized for its distribution in pipe systems (no pH-adjustment needed).
- To achieve low germ counts, zero pathogenic germs and acceptable (neutral) odour and taste in most cases some physical and chemical properties of the raw water are to be changed by treatment as well.
- Germs are inactivated by UV-C irradiation (254 nm wavelength) within a special UV-reactor.
- UV-inactivation of germs works only in the case of water being transparent for UV radiation so that particles causing turbidity and dissolved molecules of organic compounds causing colour and absorption in the range of UV have to be removed before the UV disinfection unit.
- Particles are removed by filters with μm – porosities.
- Dissolved organic compounds affecting UV-transmission are removed by a charcoal adsorber as well as odour and taste.

Principle of disinfection with UV (UV-C, 254 nm wavelength)

- Wavelength of radiation from UV-lamps approximates the absorption maximum of the DNA (260 nm).
- Hence the UV-light is absorbed by the DNA and induces a photochemical reaction.
- By this bacteria are completely inactivated and subsequently die off
- UV targets the basic action of bacteria, their reproduction - the other disinfection methods act unspecifically on the surface of bacteria by chemical decomposition (oxidation)



Limitations of disinfection processes, pre-treatment

- All disinfection processes are limited by some other water ingredients, like dissolved and particulate organic material, turbidity and suspended material (e.G. particulate minerals) at all.
- UV-disinfection notably can be malfunctioning by intensive colour (dissolved iron salts, humic substances, algae)
- hence before UV-disinfection (and disinfection at all) there has to be pre-treatment
- RSD small scale devices therefore contain a filter group comprising a coarse filter (1) a charcoal absorber (2) and a microfilter (3) at least



Filter action and maintenance

- The coarse filter (1) removes bigger particles and, in the presence of algae and after a while of action, the filter action increases but the flow rate decreases. If it is blocking it has to be cleaned. Occasionally sand and sediments can be removed via the bottom valve.
- The charcoal absorber (2) removes organic substances like mineral oil or other organics causing odour and taste and even pesticides. It has to be changed every 6 month minimum or in the case of odour and taste of the drinking water.
- The microfilter (3) acts like the coarse filter and removes fine particles and turbidity. It has to be changed if the flow rate is becoming too low or every 6 month minimum



Cleaning the device and maintenance

- For cleaning use usual dishwashing detergent. Please take care of hygiene and cleanliness like it is common in connection with food and beverages.
- For storage (longer than 2 days) please take out the charcoal and the microfilter, screw on the filter housings again and fill the the tube, the filter housings and the UV-unit with water containing disinfection solution Hypodes® and pHred® (available at your RSD-dealer) by pumping or pressure. Leave the solution for 2 hours in the device, then drain the device. Let the filters dry in the sun, for instance, before storage.
- Changing filters every 6 month minimum
- Change UV-Lamp after 7000 h of action or once a year.

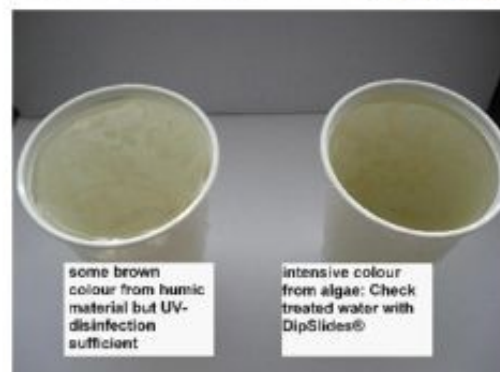
Assessing raw water sources

Avoid when possible

- raw water with direct faecal impact (cesspools), when indicated dig a standpipe beneath the banks of the contaminated waterbodies
- raw water with intensive turbidity to spare filters
- raw water with intensive colour, when indicated check disinfection activity using DipSlides®
- raw water with intensive smell and bitter taste, this may indicate toxic industrial effluents. Note that the toxic parameters of the raw water have to meet WHO guidelines

Prefer when possible

- (even this waters contain germs)
- rain water (reservoirs)
- well water (or little creeks)
- ground water (standpipes)
- bank filtrate
- in general waters with preferably long contact with natural environment



Drinking water from the Niger river near Bamako



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