

# RANGE OF WATA® DEVICES

## A SOLUTION FOR DISINFECTION AND WATER TREATMENT



# FAQ - FREQUENTLY ASKED QUESTIONS

Dear user,

If you have questions concerning a device from the WATA® range or about WATA® reagents, we encourage you to first refer to the operating manuals at:

<http://www.antenna.ch/en/activities/water-hygiene/operating-instructions-wata/>

If the answer to your question is not in the operating manuals, it is probably answered in the questions list below.

As a last resort, you can contact our technical service by email at [research@antenna.ch](mailto:research@antenna.ch) or by phone at +41 22 737 12 60.

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### WATA® DEVICE

#### 1. WHICH DEVICES ARE OF THE WATA® PRODUCT RANGE?

There exists 5 different WATA® devices for the production of sodium hypochlorite. Each device is aimed at a specific public and for a specific use. The 5 WATA® devices are : the Mini-WATA®, the WATA-Standard®, the WATA-Plus®, the Midi-WATA® and the Maxi-WATA®.

	MINIMAL CAPACITY (L)	RAFFINED SALT (g)	SATURATED BRINE (mL)	AVAILABLE CHLORINE PRODUCTION (g/H)	PRODUCTION TIME
Mini-WATA®	0.5	12.5	40	1	3 h
WATA- Standard®	2	60	190	4.8	2 h 30
WATA-Plus®	15	375	1100	22.5	4 h
Midi-WATA®	30	750	2400	45	4 h
Maxi-WATA®	60	1500	4700	80	4 h 30

#### 2. WHAT IS THE PRICE OF THE WATA® DEVICES AND WHERE CAN I BUY ONE?

You can buy a WATA® device by filling the following ordering form:

[https://antenna.odoo.com/fr\\_FR/shop](https://antenna.odoo.com/fr_FR/shop).

#### 3. WHAT ARE THE BENEFITS OF USING A WATA® DEVICE FOR THE LOCAL PRODUCTION OF CHLORINE?

	LOCAL PRODUCTION OF CHLORINE WITH WATA® DEVICES	OTHER CHLORINATION SOLUTIONS
LEAD-TIME	None. Chlorine can be produced within a few hours (2h30 to 4h30).	Up to several weeks. The products have often to be imported.
TRANSPORT	No transport.	Restrictions on chlorine transport have to be considered.
AVAILABILITY	Immediate	High risk of shortage in case of emergency.
COST	Less expensive. 0.06 USD/L.	0.5 USD/L with chlorine tablets. 0.2 USD/L with bleach having a similar chlorine concentration as the WATA® solution (6g/L)

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### 4. WHAT IS THE WORKING PRINCIPLE OF THE WATA® DEVICES?

The WATA® technology uses a simple electrolysis process that transforms a saltwater solution into sodium hypochlorite.

### 5. WHICH SOURCES OF ELECTRICITY CAN BE USED TO POWER THE WATA® DEVICES?

Several electricity sources can be used depending on the chosen device: electricity grid, battery or solar module. A solar module consists of a solar panel, a charging regulator and a battery.

### 6. WHY IS A BATTERY NEEDED WHEN USING A WATA® DEVICE WITH A SOLAR MODULE?

Having a battery with the solar panel ensures unbroken production capacity during the evenings and during days without sunshine.

### 7. WHY IS A SOLAR CHARGE CONTROLLER NEEDED WHEN USING A WATA® DEVICE WITH A SOLAR POWER SOURCE?

A charging regulator improves the operation of the device by optimizing the charge and the discharge of the batteries.

### 8. WHAT IS THE IMPACT OF INSTABILITY OF THE ELECTRICITY GRID ON THE WATA® DEVICE?

Unstable current can cause a failure of the power supply. It is important to use a voltage controller when you observe current fluctuations or if power outages happen frequently on your production site.

### 9. WHAT IS THE ELECTRICAL POWER REQUIREMENT/CONSUMPTION OF A WATA® DEVICE?

The rated power of the WATA® devices depends on which product is used:

- Mini-WATA®: 10 W
- WATA-Standard® : 48 W
- WATA-Plus® : 180 W
- Midi-WATA® : 430 W
- Maxi-WATA® : 720 W

### 10. WHAT IS THE WARRANTY ON THE WATA® PRODUCT RANGE?

All WATA® devices are guaranteed for a period of 2 years.

### 11. WHAT IS THE LIFETIME OF THE WATA® DEVICES?

It has a lifespan of 5 years assuming one production per day, 5 days a week (5 productions per week) and proper maintenance of the device.

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### 12. WHAT MAINTENANCE IS REQUIRED FOR A WATA® DEVICE?

- Ideally, the power supply is to be placed in a room adjacent to the production room. If this is not possible, place it as far as possible from the container where the chlorine is produced, in order to avoid contact with chlorine vapor which is highly corrosive. The power supply should not be placed on floor level.
- The devices need to always be immersed in the saltwater solution before being plugged in to the power supply.
- The devices need to be rinsed with clear water after each production.

### 13. WHY AND HOW DO THE WATA® DEVICES HAVE TO BE WASHED?

Limestone deposits are formed during the production. This decreases the efficiency of the device and significantly reduces its lifetime. If, after several uses, you see white marks on the device, prepare a solution with 50% of clear water and 50% of vinegar. Soak the device for 24 hours and then rinse it with clear water. Never rub the titanium plates!

### 14. WHAT TO DO WHEN THE CONCENTRATION OF SODIUM HYPOCHLORITE PRODUCED BY MY WATA® DEVICE IS DIFFERENT FROM 6 G/L?

In such cases, it is enough to adapt the dilution of the sodium hypochlorite solution for the desired use. There are dilution tables for water treatment and for disinfection.

### 15. HOW MANY LITRES OF DRINKING WATER CAN BE TREATED WITH A WATA® DEVICE?

The usual dilution ratio is 1 for 4000, meaning that 1 litre of sodium hypochlorite solution can treat 4000 litres of water. For the different devices of the WATA® product range and considering a usual dilution, it means:

- 2000 litres for a production with the Mini-WATA®
- 8000 litres for a production with the WATA-Standard®
- 60'000 litres for a production with the WATA-Plus®
- 120'000 litres for a production with the Midi-WATA®
- 240'000 litres for a production with the Maxi-WATA®

### 16. HOW MUCH DOES IT COST TO PRODUCE ONE LITRE OF CHLORINE WITH A WATA® DEVICE?

0.06 USD without the amortization of the device and assuming a cost of the electrical kWh of Burkina Faso and of Geneva.

### 17. WHAT IS THE LIFETIME OF THE WATATEST® AND WATABLUE® REAGENTS?

If appropriately stored, the WATATEST® can be used for up to 2 years after its production. The WATABLUE® reagent can be used up to 1 year following its production. Make sure to always check the expiry date written on the label of the products.

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### 18. WHAT ARE THE LIMITS OF THE USE OF THE WATATEST® AND WATABLUE® REAGENTS?

**- WATATest® :**

Several reliability studies have been conducted on the WATATest® reagent. It was determined that the reagent was reliable when measuring a concentration between 1 and 7 g/L with a precision of 0.5 g/L. The pH of the measured solution has to be below 11.4. This means that the WATATest® reagent is not suitable to measure the active chlorine concentration of stabilized hypochlorite solutions (pH > 11.9). In this case, the thiosulfate titration method has to be used.

**- WATABLue® :**

There are no specific restrictions for the use of the WATABLue® reagent

## SODIUM HYPOCHLORITE

### 19. WHAT ARE THE DIFFERENT POSSIBLE USES OF THE CHLORINE SOLUTION PRODUCED WITH THE WATA® DEVICES?

#### WATER TREATMENT

##### IN HOUSEHOLDS

- Handwashing
- Floors, latrines, showers
- Vegetable washing
- Cooking utensils, workbench

#### DISINFECTION

##### IN HEALTH STRUCTURES/HOSPITALS

- Handwashing
- Disinfection of wounds (Dakin)
- Floors and latrines
- Clothes, bed linen
- Laboratory equipment

Where :

Households, communities, distribution networks, wells, hospitals, health centres, prisons, refugee camps, restaurants, etc...

See the dilution table in the manuals.

### 20. WHY DO CHLORATES NEED TO BE AVOIDED?

At high dosage, chlorates are potentially dangerous for health. During production with WATA® devices, the quantity of chlorates that is produced is significantly below the norm of the WHO (200 times below the WHO norms after water chlorination).

### 21. WHAT IS THE « SODIUM HYPOCHLORITE SOLUTION » PRODUCED BY THE WATA® DEVICES?

Sodium hypochlorite is a non-corrosive chlorine derivative that is able to kill or to inactivate a large majority of living germs. This solution can be used for the chlorination of water. It is sometimes called "active chlorine solution" and its concentration is based on the number of grams of active chlorine per litre. The WATA® devices produce a concentration of 6 grams of active chlorine in 1 litre of solution (6g/L).

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### 22. WHAT IS THE DIFFERENCE BETWEEN BLEACH AND THE SOLUTION PRODUCED BY THE WATA® DEVICES?

The sodium hypochlorite solution produced by WATA® is less corrosive than bleach. Bleach has a concentration of active chlorine six times higher and has a pH of around 11-13; this makes it more corrosive than the sodium hypochlorite produced by WATA®. Bleach cannot be used as a Dakin solution, unlike the solution produced by WATA®.

The sodium hypochlorite solution produced is less stable than bleach although stabilisation procedures are available for WATA® solutions.  
[Please refer to the Stabilisation Manual](#)

### 23. WHAT IS THE LIFETIME OF THE NON-STABILIZED SODIUM HYPOCHLORITE SOLUTION?

The sodium hypochlorite solution produced with the WATA® devices has to be used within 24 hours following its production. For a longer conservation period, the solution needs to be stabilized with caustic soda.

### 24. WHICH PRECAUTIONS NEED TO BE TAKEN FOR AN OPTIMAL CONSERVATION OF THE SODIUM HYPOCHLORITE SOLUTION?

The sodium hypochlorite solution is unstable. It is therefore important to comply with the lifetime of the product and with strict storing conditions.

The sodium hypochlorite produced with the WATA® devices has to be conserved in an opaque, non-metallic, clean, labeled and sealed recipient. The recipient has to be kept in a cool place, out of the reach of children. Do not expose it to the sun.

### 25. HOW CAN THE CONCENTRATION OF THE SODIUM HYPOCHLORITE SOLUTION PRODUCED BY A WATA® DEVICE BE TESTED?

The control of the concentration of the sodium hypochlorite solution is necessary after each production. For this purpose, use the WATATest® reagent furnished with every WATA® kit.

### 26. WHAT IS THE “CHLORINATION OF WATER WITH SODIUM HYPOCHLORITE”?

It consists of adding a dose of chlorine to potentially contaminated water in order to destroy all pathogenic germs. The dose to be added depends on the initial quality of the water and on the concentration of the sodium hypochlorite solution (see dilution tables).

After having added the chlorine, wait 30 minutes to allow time for the chlorine to act. The water can then be tested with the WATABLue® reagent to measure the presence of residual chlorine.

Note that it is essential to chlorinate only clear water. If the water to be treated is clouded or coloured, it is necessary to clarify it before chlorination by filtration, sedimentation or flocculation.

[Please refer to the Dilution Guide](#)

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### 27. WHAT IS THE “RESIDUAL CHLORINE” AND WHY IS IT IMPORTANT?

The residual chlorine corresponds to the chlorine concentration after the treatment of drinking water (minimum contact time : 30 minutes). A concentration of residual chlorine between 0.5 and 1 mg/L indicates that the bacteria have been correctly killed or inactivated. Moreover, the residual chlorine in the drinking water provides a protection against new contaminations of the water by pathogenic micro-organisms.

It is important for the chlorination of drinking water to be done under the supervision of a qualified person. To test the residual chlorine level, Antenna Technologies has developed a simple and cheap reagent: the **WATABLue®**.

### 28. WHAT IS THE EFFICIENCY OF THE CHLORINATION OF DRINKING WATER?

Chlorine efficiently destroys almost all pathogenic germs. It helps fight against diarrhea, dysenteries, cholera, typhoid fever, salmonella and hepatitis A. It is inefficient against protozoan cysts and against some kinds of parasitic worms (helminths).

### 29. IS CHLORINATION EFFECTIVE FOR NEUTRALIZING AGAINST HEAVY METALS AND AGAINST OTHER CHEMICAL POLLUTANTS OF WATER?

No, active chlorine does not effectively reduce or neutralize chemical pollution of water (for example with heavy metals, pesticides, medications ...)

### 30. WHAT TYPE OF WATER CAN BE TREATED WITH THE SODIUM HYPOCHLORITE SOLUTION PRODUCED BY THE WATA® DEVICES?

It is important to only chlorinate water of sufficient quality :

- The water to be treated has to be clear (not turbid, maximum turbidity index of 5 NTU). In case of muddy, clouded or coloured water, the water need to be filtrated or decanted.  
[Please refer to the Chapter 4 - Water Quality- of the WATA Manual](#)
- The pH of the water must be between 6.5 and 8.5.

### 31. WHAT IS DISINFECTION WITH THE WATA® SODIUM HYPOCHLORITE SOLUTION?

Disinfection is a process during which pathogenic germs are eliminated. It is used to stop or to prevent an infection of the water by micro-organisms. Disinfection can be used for the cleaning of various tools, of sensitive rooms and surfaces (e.g. latrines), vegetables, or for washing hands or clothes, etc... (See dilution tables for disinfection).

**CAUTION:** disinfection with sodium hypochlorite is NOT sterilization and cannot be used, for example, to sterilize surgical tools.

### 32. CAN THE CONCENTRATED ACTIVE CHLORINE SOLUTION BE USED FOR THE STERILIZATION OF SURGICAL MATERIAL?

No, not under any circumstance.



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### 33. CAN THE PRODUCED SODIUM HYPOCHLORITE BY WATA® BE USED AS DAKIN SOLUTION?

Based on a study conducted by Antenna Technologies, the concentrated active chlorine solution produced using the WATA® devices can be used as Dakin solution. The hypochlorite solution can simply be used without dilution, by applying it with a clean compress to the wound to be disinfected.

As the WATA® hypochlorite solution has a slightly higher chlorine concentration than classic Dakin solution (6 g/L instead of 5g/L), the antiseptic quality of the hypochlorite solutions produced with a WATA® device is even better than the one of commercial Dakin solutions.

### 34. WHAT IS THE “STABILISATION OF THE SOLUTION” AND TO WHOM IS IT DIRECTED?

Due to its high pH, the hypochlorite solution produced with a WATA® device is unstable. It has to be used within 24 hours following production.

A procedure of basification of the hypochlorite solution was created to allow the storage of the solution for a duration of up to 6 months. This method, called « stabilisation », is mostly used in programs where chlorine is bottled. It is reserved for persons who are qualified to work in a laboratory as the method involves the use of dangerous chemicals, such as caustic soda (pH 11.8 – 12). [Please refer to the Stabilisation Manual](#)

**Be careful:** Once the hypochlorite is stabilized, the WATATest® reagent cannot be used. To measure the concentration of active chlorine of the solution, the thiosulfate titration method has to be used.

### 35. IS IT POSSIBLE TO USE THE SODIUM HYPOCHLORITE SOLUTION DIRECTLY AFTER STABILISATION?

Yes.

### 36. WHY IS STABILIZED CHLORINE NOT USED FOR WOUND DISINFECTION?

The stabilized chlorine solution has a high pH, which makes it irritating to the skin.

### 37. WHAT SHOULD BE DONE WITH UNUSED SODIUM HYPOCHLORITE SOLUTION?

Before starting production, it is important to correctly size the production to avoid producing excesses of hypochlorite.

If a surplus of solution cannot be avoided, it is recommended to stabilize the surplus solution for later use.

### 38. HOW COULD I ELIMINATE THE TASTE OF CHLORINE IN MY DRINKING WATER?

There are several products that can neutralize chlorine taste in drinking water. We can use for instance lime/lemon juice or sodium thiosulfate.

**Beware,** would you use such product, the treated water will not contain residual chlorine and will not be protected from future contamination. It is therefore absolutely necessary to wait the last moment before treating water with such products.

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### RISKS

#### 39. ARE THERE RISKS LINKED TO THE USE OF DEVICES OF THE WATA® PRODUCT RANGE?

The WATA® devices are powered by electrical current. The power sources have to be handled with the usual caution. All the devices work at low voltage, reducing the risks of electrocution.

The combination of the produced gas (chlorine and hydrogen) can be explosive at high concentrations. When using small devices or a small number of large devices, the risk is low. For larger production infrastructures or for production units of bottled chlorine, an adapted ventilation of the production room is needed.

#### 40. HOW TO DISPOSE OF THE SODIUM HYPOCHLORITE SOLUTION?

Due to its high oxidizing and anti-bacterial properties, sodium hypochlorite severely damages micro-organisms and aquatic flora. Before throwing it away, it is important to neutralize the active chlorine with a dechlorination reagent, such as sodium thiosulfate, sodium sulfite or sodium metabisulfite.

After dechlorination, the solution can be poured in the drains, following the instructions of the local authorities.