

# T-Chlorinator

Source Protection

Safe Transportation

Sedimentation

Filtration

Disinfection

Safe Storage

## What is it?

A Tablet chlorinator (T-chlorinator) is an in-line device that disinfects water without electricity using a capsule that holds solid chlorine tablets. As water flows through, the tablets break down and release active chlorine that disinfects the water. T-chlorinators are often constructed from locally sourced products, but also come in a variety of commercially available options. T-chlorinators can be installed at the point of collection; for example, on the spout of a hand pump or in-line before a storage tank in a pipe system.

## Performance

### Microbiological effectiveness

The table below summarizes the disinfection effectiveness of chlorine when correctly dosing:

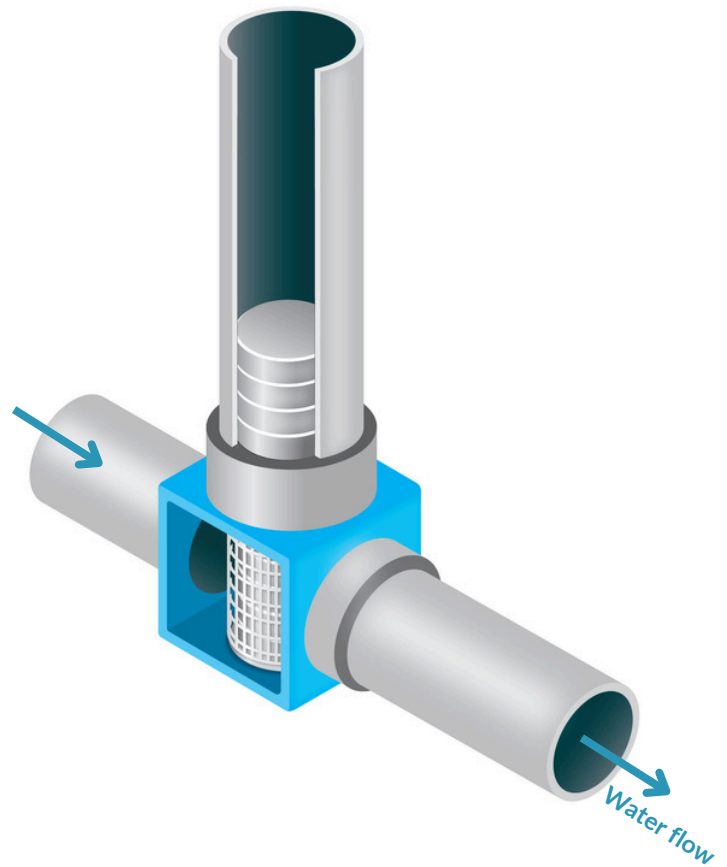
Parameter	Effectiveness
Bacteria	Very Effective (>99%)
Viruses	Very Effective (>99%)
Cryptosporidium (Protozoa)	Not effective (<80%)
Ascaris (Helminth)	Not effective (<80%)

### Other parameters

Not effective for chemical contaminants or turbidity.

### Source water requirements

Turbidity, organic matter, pH, flow rate, and temperature affect how well chlorine works and how much chlorine is required. When possible, cloudy water should be pre-treated through sedimentation or filtration before using chlorine. Ideal turbidity should be below 5 NTU. Disinfection is less reliable if the pH is below 5.5 or above 7.5.



## Capacity

Depends on the type of device and the water quality. Ranges for specific products include: PurAll 50H — each cartridge has a lifetime capacity of treating 125,000 L at 8L/min. Aquatabs inline — 360,000 L per cartridge for 2-3ppm dosage rate. Aquatabs FLo — 90,000 L per cartridge at 2ppm dosage rate.

## Life span

Varies per device and depends on flow rate and quantity of hours of operation. Replace when breaks or cracks in the device occur. The solid chlorine tablets have a shelf life of 3-5 years when stored properly. Refer to packaging when available.

## Calibration and Dosage Adjustment

Regularly test the free residual chlorine at the outlet to ensure proper dosage. Adjusting the dosage can be challenging due to varying water quality. Users may have little control over dosage adjustments. Some devices may have adjustable slits that allow water to pass through the device. To adjust dosing, you can increase or decrease the amount/size of slits. Adding or adjusting a manual bypass can also impact dosing. Refer to the manufacturer's instructions and installation options on each device when available.

## Ease of use and acceptability

### Operation and maintenance

To introduce tablet chlorinators, the community requires some established infrastructure — pipes/hand pumps/storage tank — to integrate the device. This device can be installed directly before a water outlet, but still requires a contact time of at least 30 minutes before drinking. This can be accomplished in the users' covered containers after collection from an outlet or by adding an in-line storage tank after the device. Tablet chlorinators require minimal operation and maintenance. Generally, in-line chlorinators only require the following:

- Free-residual chlorine testing at the outlet and household to ensure proper dosage and to meet odour/taste preferences.
- Other general maintenance to ensure the device is operating as intended. This can include checking the flow rate and inspecting the piping and cartridge to ensure no leaks, clogging or damage.
- Routine checks for chlorine replenishment.

### Repair and replacement

New chlorine tablet refills are required and should be purchased before the device is low or empty. For some devices the whole cartridge (capsule holding chlorine) may need replacement. T-Chlorinators with high flow rates will consume tablets faster and require more frequent replacement.

### User considerations and preferences

An ongoing supply chain is needed for replacement chlorine tablets. Chlorine products degrade over time and must be stored in a dry, dark and secure location. See *Store Chlorine Products Safely Poster* and *Handle Chlorine Products Safely Poster* for more information. Some users do not like the taste or smell of chlorine.

## Feasibility

### Availability

Tablet chlorinators can be purchased commercially, and have also been made locally. Tablets can be difficult to produce and acquire locally, depending on size and type required, but can be bought in bulk and packaged locally.

Tablets come in different sizes, and using the wrong size can cause problems. The tablet size should match the system. Tablets also vary in hardness, which affects how much water flow is needed to release the right amount of chlorine. When switching suppliers, be mindful, as it may change how often you need to add new tablets. If you change the product, the system will need to be recalibrated, taking into account the tablet's composition and the water quality.

### Cost

The cost of in-line T-chlorinator devices and the cost of refill chlorine product can vary based on local market prices. The capital cost of commercially available tablet chlorinators can range from US\$7 to US\$662, with an average cost of US\$140 (in 2021 USD, according to a review written by Meghan Lindmark in 2022, see *Passive In-Line Chlorination for Drinking Water Disinfection: A Critical Review* below for more information). The cost of refill tablets is site specific based on local market prices. The price of chlorine cartridge refills is in the range of \$0.05-0.09 per 1,000L based on a study done in Nepal in rural communities from 2018-2019 for the Aquatabs Flo and PurAll chlorinators.

### Size and weight

Tablet chlorinators vary in weight and size depending on chosen capacity. Typically, they weigh approximately 1-5kg and are easily held in your hand.

### More information

1. [Store Chlorine Products Safely Poster](#)
2. [Handle Chlorine Products Safely Poster](#)
3. [Check Before You Disinfect: Turbidity, pH, and Temperature in Drinking Water Chlorination](#)
4. [Chlorine Disinfection of Household Drinking Water](#)
5. [Crider, Yoshika S., et al. "Passive In-Line Chlorination for Drinking Water Disinfection: A Critical Review." \*Environmental Science & Technology\*, vol. 56, no. 13, 2022, pp. 9164–9181. <https://doi.org/10.1021/acs.est.1c08580> \[pubs.acs.org\]\(https://pubs.acs.org\)+4](#)

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