

# CLEANING OF WATER TANKS AND CONTAINERS FOR CARAVANS AND MOTORHOMES

By [www.zappysblog.com](http://www.zappysblog.com)

## DRINKING WATER TANKS & CONTAINERS

### Introduction

This article advises on cleaning and disinfection of drinking and grey (waste) water vessels housed within Motorhome's and containers commonly used in caravanning and camping.

### Why Disinfect?

All water in the UK (and most European) Countries contain a small residual (0.2mg/l) of to prevent secondary infection, so why clean and disinfect? Sodium hypochlorite (chlorine) comes out of solution as a gas, very quickly once it has left the water main. Water left standing in a tank or container will soon lose the small residual amount of chlorine leaving the water open to infection. How soon will depend on the temperature and whether the chlorine has to combat any infection it comes into contact with, when that happens the chlorine is used up right away. Disinfection using sodium hypochlorite is only effective against disease causing bacteria called pathogenic bacteria. These microbes are present in most all untreated surface waters. Most common waterborne pathogenic bacteria are typhoid, cholera, E.coli, campylobacter, salmonella norovirus and more. Disinfecting will also remove viruses, moulds and algae which can also develop over time if the vessels are not used.

Some types of infection called Oocysts are virtually unaffected by standard disinfection methods. They are found in most animals and in the ground so any contact with the ground can risk introducing them to the water container. There are two main types of oocyst; Giardia Lamblia and Cryptosporidium once introduced to water, can survive for weeks, even at low temperatures and if ingested cause sickness and diarrhoea which can also last for weeks. There is no known cure and recovery is down to the person's immune system and management of diet, the elderly, sick and children are worst affected.

Following simple hygiene rules and disinfecting vessels regularly at least once a year will help in the prevention of secondary infection by either oocysts or pathogens:

- **Always keep tanks and containers closed\* at all times to prevent airborne infection entering (flying insects; flies, mosquitoes, gnats, lace wings and also crawling insects such as spiders beetles, lice etc.)**
- **Never rest the drinking water cap or hose ends on the ground where it might become infected wash them under a running tap or use a bleach spray or wipe.**
- **Ends of hose connection taps and hose pipes can also be disinfected with bleach spray or wipes.**

\*The Water Regulations for storage cisterns state:

*'When an installation is intended to provide wholesome water it must comply with Clause G16.13 of the Government Guidance viz.:*

*Cisterns storing water for domestic purposes should be watertight and, where required, be lined or coated with a suitable impermeable material; they shall be provided with warning and overflow connections, as appropriate, which are so constructed and arranged as to **exclude insects**. They should have a rigid, close fitting and securely fixed cover which is not airtight but which **excludes light and insects** from the cistern'.*

Although vessels in motorhomes are not covered by the regulations, it is the guiding principle of preserving water quality by keeping vessels closed and eliminating infection from airborne infection and insects, that is relevant.

### Disinfection



If you have significant contaminating material in the container at the start this must be removed first before the disinfection process is commenced. This is largely because the disinfection process will only sterilise the inside surfaces of tanks and containers, it will not remove any material that may be present. However this point should rarely be encountered with leisure vehicles unless material has been introduced inadvertently.

There are many proprietary brands of disinfection products available but nearly all contain sodium hypochlorite or chlorine (**as used in all mains drinking water systems**) in some strength or another e.g. Milton, Puriclean (Sodium Dichloroisocyanurate chlorine derivative) and Chlorine Rapid Release 1000mg/l Tablets etc. On some products, the strength is not always stated, merely ('use x tablets per y litres of water') but with the tablets it is precise. Having a many years

experience in the disinfection of water systems, **I prefer to use Rapid Release 1000mg/l Tablets which contain 1 gram of**

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**free chlorine or 1000milligrams per litre in 1 litre of water.** They are in tablet form and are relatively safe for storage, very cost effective, and will not degrade if kept dry and are accurate when measuring the strength. Almost any of the other proprietary products can be used but the important bit is to identify the strength in milligrams per litre or parts per million (both the same) as this makes it easy to get the right concentration. I never use household bleach because most of them contain surfactants which may be detergent based. They are added to facilitate surface wetting and break down fats and grease. It may be more difficult to completely flush them out and could lead to taste problems.

## How Many Tablets?

The Rapid Release 1000mg/l Tablets: 1 tablet makes 1 litre @ 1000mg/l or parts per million (both the same) concentration. (House hold bleach is normally 3 – 5 % or 30 to 50000mg/l or 50 times stronger than 1 1000 tablet.) **We need 20/25 mg/l (ppm) standing for a period of 1 hour minimum and 2 hours maximum.** One tablet in 1 litre solution will disinfect  $1000/20 = 50$  litres of water at 20mg/l, or  $1000/25 = 40$  litres at 25mg/l Many on board tanks are of the order of 80litres or 18 gallons. So, 2 tablets will do 100 litres at 20mg/l (ppm) or 80 at 25mg/l. It does not have to be that precise, if the concentration is stronger the contact time can be less and if weaker leave longer but **never longer than 2 hours**. I always stick to the 2 hour maximum because it is possible that if left longer the sodium hypochlorite may leech into the plastic material and cause a taste reminiscent of TCP. If you want to work out the exact number of tablets use the following formula: (Capacity of your tank x strength (20m/l))/1000 = Number of 1000mg/l tablets, or use the following table.

| DRINKING WATER TANKS & CONTAINERS  |     |     |     |     |     |     |     |     |     |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| NUMBER OF TABLETS REQUIRED FOR 20mg/l CONCENTRATION                                    |     |     |     |     |     |     |     |     |     |
| Capacity in Litres   | 45  | 60  | 80  | 100 | 120 | 140 | 160 | 180 | 200 |
| Capacity in Gallons  | 10  | 13  | 18  | 22  | 26  | 31  | 35  | 40  | 44  |
| Number of Tablets  | 0.9 | 1.2 | 1.6 | 2   | 2.4 | 2.8 | 3.2 | 3.6 | 4   |
| Round tablets up to nearest whole number and reduce contact time (MIN 1 HR. MAX 2 HRS) |     |     |     |     |     |     |     |     |     |

Any volume of tank can be calculated for the number of tablets required.

## Procedure for Drinking Water Tanks

The procedure is very simple and safe if you follow a few basic rules:

1. Put the required amount of tablets into the tank through the filler cap and fill to the brim with fresh mains water.
2. Leave to stand for a minimum of 1 hour and a maximum of 2 hours dependant upon the strength. Never leave for more than 2 hours as this can lead to tastes problems as described above.
3. Open the tap on the tank and allow the liquid to empty to a suitable drain. It is a good idea to flush the drain with your hosepipe to dilute the liquid to a harmless level.
4. I do not draw the liquid through the system in the motorhome as this may run a small risk of being detrimental to pumps and hot water systems.
5. Refill the tank and you can now draw this water through the motorhome (there will be small residual chlorine which will combat any mild infection in the pipe work) and into the grey water tank. (Note: if you are cleaning the waste tanks at the same time you can add the tablets or bleach as described below in Grey Water Tanks)
6. Refill the fresh water tanks and you are done.



Should you detect any taste problems then re flush and refill the tank and it should disappear. (Chlorine comes out of solution over time, sometimes if you get a TCP taste from mains water then fill a jug or bottle leave in fridge overnight and there will be no discernable taste.)

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## GREY WATER (WASTE) TANKS

The build up of organic matter in the Grey water tanks can lead to unpleasant smells ('bad eggs') and can be treated in the same way to kill off the bacteria causing the problem. For this I would use a strength of 50mg/l (double that of drinking water tanks) and double the contact time to 4 hours. Household bleach can be used for this purpose but I prefer the tablets for convenience (they are always on hand and easy to store) and safety reasons. With liquid bleach there is always a danger of spillage, with resultant damage to what ever it comes into contact with. Some metal sinks will not tolerate neat bleach being poured into them, but a tablet placed on the sink outlet whilst the tap is running alleviates any risk of damage as the sodium hypochlorite is being diluted all the time. Another factor is strength; bleach it can be anything from 1% to 6% whereas tablets are always accurate.

### Strength

The strength and contact time is not as critical as for that as drinking water tanks as there will be no risk of taste problems etc. Both are doubled for that of drinking water tanks as there will be more organic and bacterial deposits from the grey water (see table below).

| GREY WATER TANKS & CONTAINERS  |     |    |    |     |     |     |     |     |     |
|--|-----|----|----|-----|-----|-----|-----|-----|-----|
| NUMBER OF TABLETS REQUIRED FOR 50mg/l CONCENTRATION                                    |     |    |    |     |     |     |     |     |     |
| Capacity in Litres   | 45  | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 |
| Capacity in Gallons  | 10  | 13 | 18 | 22  | 26  | 31  | 35  | 40  | 44  |
| Number of Tablets  | 2.3 | 3  | 4  | 5   | 6   | 7   | 8   | 9   | 10  |
| Round tablets up to nearest whole number and reduce contact time (MIN 2 HR. MAX 4 HRS) |     |    |    |     |     |     |     |     |     |

### Procedure for Grey Water (Waste) Tanks

1. Work out the number of tablets for the capacity of waste tank.
2. Place the tablets one at a time in one (or more) of the outlets.
3. Turn on tap(s) as the tablet(s) dissolve, add further tablets until all are dissolved.
4. Fill tanks to maximum
5. Leave for 4 hours
6. Empty out to drain and flush.