

## How to Clean and Disinfect a Cistern

Cisterns are watertight containers to protect and store drinking water. In some circumstances, the water from a cistern may not be safe to drink.

If cistern collars, lids, fill ports, or screened vents are damaged, germs (contaminants) may get in. If the cistern structure is damaged (e.g., frost, settling), cracking below the surface may happen, which could let contaminated groundwater and soil in. Cisterns in areas at risk for floods may also be at risk of overland flooding from surface water. If you see any areas that germs could get in or your test results show the water is contaminated, it's important to fix the problem.

Once the contamination problem is fixed, follow the steps below to clean and disinfect your cistern. You'll need to arrange to have an approved water hauler on-site **before** this. You need clean, safe water to clean and disinfect a cistern.

### When do I need to test my cistern for bacteria?

The Provincial Laboratory for Public Health (ProvLab) tests private water drinking water systems for bacteria. However, the ProvLab can't test water for every type of harmful germ.

The ProvLab does 2 standard tests (total coliforms, *E.coli*) on water samples. These results will show how likely the water is to be contaminated with bacteria. **Coliforms** are a group of bacteria that are found everywhere (e.g., soil, on plants, lake and river water). People and animals have ***E. coli*** bacteria in their bowels and stool.

### Test your cistern:

- 2 times a year for routine monitoring (e.g., in the spring, in the fall)
- whenever there are changes to the water quality (e.g., water clarity, colour, smell, taste). Check the inside of the cistern and ask your bulk water hauler if there have been any changes to the source water supply.
- when it's been disinfected (to make sure it worked)

If you know the water is contaminated (e.g., you see rodents in the cistern), clean and disinfect it **right away**. You don't need to test the water first.

## When do I need to clean my cistern?

A cistern must be cleaned to remove sediment and any other contaminants. It's a good idea to clean your cistern:

- at least 1 time a year to remove sludge and sediment build-up, or more often if the water looks, smells, or tastes different
- if contaminants (e.g., rodents, surface water from overland flooding) get in the cistern
- after it's installed and sediment needs to be removed from the bottom of the tank

## When do I need to disinfect my cistern?

Whenever a cistern is cleaned, it needs to be disinfected. Your cistern needs to be disinfected without being cleaned if:

- it's just been installed, even if there is no sediment or contaminants at the bottom of the tank
- you have plumbing maintenance work done from the inside of the tank (e.g., replacement of valves, pumps). Anyone who enters a cistern needs to wear clean footwear.
- the source water that is delivered isn't safe to drink (potable)
- a bacteria test result comes back positive. If the source of bacteria isn't easy to see, check the inside of the cistern.

## Can I clean my cistern myself?

A cistern is considered a confined space under the Alberta Occupational Health and Safety Code. Because of this, people must **not** go in a cistern unless they've been trained in confined space entry **and** they follow the safety procedures according to the Occupational Health and Safety Code. You can get information about confined space entry safety practices from [Occupational Health and Safety](#) or by calling 1-866-415-8690 (toll-free). Call a professional trained in water cistern cleaning and confined space entry if you have any questions.

## How do I clean my cistern?

1. Make sure your footwear and equipment are clean **before** you go in the cistern (follow confined space entry precautions). Drain the cistern completely. **Don't** use a sewage hauler to pump out the cistern.
2. Wash all inside surfaces of the cistern. Use a pressure washer or stiff brush and a non-corrosive, non-foaming, food-grade detergent to loosen debris and sediment. If needed, remove bottom sludge with a wet-dry vacuum.
3. Rinse the cistern with clean, potable water, and then drain the water to waste.
4. After cleaning and rinsing, the cistern is ready to disinfect (see instructions below).

## How much disinfectant do I need to use?

How much disinfectant you need depends on how much water the cistern holds. If you don't have this information, you can estimate by using the ways shown below.

### Box Cistern

To estimate how much water your **box cistern** (see Figure 1) can hold, you'll need a calculator and you'll need to know these measurements (in metres):

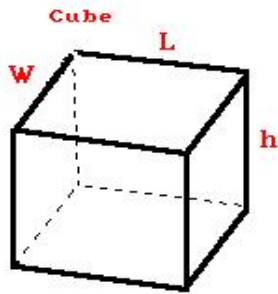
- the length (L)
- the width (W)
- the height (H) (this is the maximum depth of water)

Now, take these measurements and multiply them by each other (L x W x H). This will give you a number that you need to multiply by 1000. The answer will tell you how many litres of water your cistern can hold, so you can figure out how much disinfectant to use.

Example: If your cistern has these measurements (length= 2.5 m, width= 1.5 m, and height= 1.7 m), this is how you calculate how much water it would hold.

$$2.5 \times 1.5 \times 1.7 = 6.83 \text{ m}^3$$

$$6.83 \times 1000 = \mathbf{6830 \text{ litres}}$$



## Cylindrical Cistern

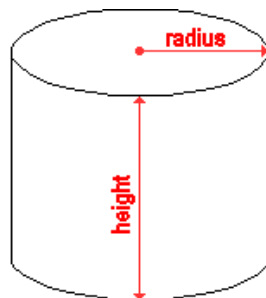
To estimate how much water your **cylindrical cistern** (see Figure 2) can hold, you'll need a calculator and you'll need to know these measurements (in metres):

- radius
- height

Now, take the measurements and follow these instructions:

1. Take the radius and multiply it by itself.
2. Take this number and multiply the number by 3.14.
3. Now, take this number and multiply it by the height.
4. Take this number and multiply it by 1000.

The answer will tell you how many litres of water your cistern can hold, so you can figure out how much disinfectant to use.



Example: If your cistern has these measurements (radius = 1.1 m and height= 1.8 m), this is how you calculate how much water it would hold.

1.  $1.1 \times 1.1 = 1.21$
2.  $1.21 \times 3.14 = 3.8$
3.  $3.8 \times 1.8 = 6.84$
4.  $6.84 \times 1000 = \mathbf{6840 \text{ litres}}$

## How do I disinfect a cistern?

When you're ready to disinfect your cistern, bypass all water treatment devices and turn off the hot water heater (electric or gas).

1. Start filling the cistern with clean, safe water.
2. As you're filling the cistern, add 1 litre of liquid, household, chlorine bleach (5.25%) for every 1000 litres of water the cistern can hold. Add the bleach while filling the cistern so they mix well. This gives a concentration of about 50 mg/L of chlorine.
3. Run each tap connected to the water distribution system until you can smell chlorine, and then close the tap.
4. Let the chlorinated water sit in the cistern and the distribution system for at least **6 hours**. After 6 hours, drain and dump the water to waste (according to safe practices). Highly-chlorinated water isn't safe to drink or give to animals. It will also cause problems if dumped in septic fields.
5. Refill the cistern with clean, safe water.
6. Run each tap for at least 5 minutes to flush the distribution lines.
7. Turn on the hot water heater. Follow the manufacturer's instructions to service any water treatment devices **before** you turn them on again.
8. Test the water in the cistern and/or distribution system for bacteria. If there are no bacteria in the water sample, the water is **safe** to drink.
9. If there are bacteria in the water sample, you need to find the source of contamination and fix the problem. After the problem is fixed, you need to clean and disinfect the water again. If there are no bacteria in the resample, the water is safe to drink.

**Contact Alberta Health Services, Environmental Public Health, North Zone at 780-513-7517 if you have questions about cleaning and disinfecting cisterns.**

**If your cistern supplies water to a public facility, like a food establishment or daycare, contact Alberta Health Services, Environmental Public Health, to arrange an inspection prior to reopening to the public.**

***For more information, please contact your nearest Environmental Public Health office.***

*Edmonton Main Office  
Calgary Main Office  
Lethbridge Main Office*

*780-735-1800  
403-943-2288  
403-388-6689*

*Grande Prairie Main Office  
Red Deer Main Office  
[www.ahs.ca/eph](http://www.ahs.ca/eph)*

*780-513-7517  
403-356-6366*

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