Cleaning and disinfection of tanker trucks

Why is it important to clean and disinfect a tanker truck ?

When a tanker truck is used to transport drinking water, some contamination almost always gets into the tank. Other fluids may have been transported in the tank, for example, milk or irrigation water. Dust and dirt from repair workers may also get into the tank. It is important to kill any germs which are in the tank before it is used to store and transport drinking water.

Tanker trucks are often used in urban and peri-urban areas to deliver water to households. Tanker trucks can become very contaminated if they are not cleaned regularly and filled with properly chlorinated water for drinking. If one load of contaminated water is carried and the tanker not cleaned and disinfected, germs will live in the tanker and contaminate subsequent, possibly clean, loads.

Before filling with water, the inside of the tank should be spray-rinsed with a 0.2 per cent solution of chlorine using an electric or hand operated pump with a reservoir and hosepipe with a spray nozzle. After spraying the inside of the tanker, leave it closed overnight or for at least four hours. Before filling the tanker with clean drinking water, rinse the tanker out with clean drinking water. If the clean drinking water is chlorinated, then the tanker can be filled ready for deliveries.

Making up a chlorine solution

There are various ways of disinfecting tanker trucks, but the most common is to use chlorine. The two forms of chlorine suitable for disinfecting tanker trucks are calcium hypochlorite and sodium hypochlorite. These are described in Fact Sheets 2.19 and 2.20.

Normally, a 0.2 per cent solution of chlorine should be made up using either sodium hypochlorite (liquid bleach) or calcium hypochlorite (HTH).

Safety for operators handling chlorine

The operation and maintenance of equipment for dosing of chlorine from cylinders should only be undertaken by trained and authorized personnel.

Chlorine is a hazardous substance. In solution it is highly corrosive and splashes can cause burns and damage the eyes.

When handling concentrated chlorine solutions, appropriate precautions should be taken. Ideally, gloves and protective eye glasses should be worn. In the event of splashes and especially splashes to the eyes, it is important immediately to rinse thoroughly with water.

All containers in which chlorine is stored should be labelled, identifying the contents, and with a hazard warning in a form which is readily understood locally.

Storage sites for chlorine in any form should be secure against unauthorized access and especially against children.

Sodium hypochlorite or liquid bleach

Liquid bleach is normally bought in bottles or sachets. Check that the contents are sodium hypochlorite and water only. The normal concentration of chlorine in liquid bleach is five per cent, but this may be lower if the bottle has been opened or stored for a long time (Fact Sheet 2.20 gives further details). Make up the solution as shown in Box 1.

Box 1. Using sodium hypochlorite (liquid bleach) to make a chlorine solution

- Fill three plastic buckets with clean water to about 5 cm from the top to allow for the bleach to be added. Most commercially available buckets hold 12.5 litres, but the quantity of water should be checked.

- Add enough liquid bleach to each bucket to make up a 0.2 per cent solution of chlorine.

  Example : Capacity of bucket, 12.5 litres water = 12500 millilitres.

  Need 0.2% or 0.2 grams of chlorine per 100 millilitres of water,

  therefore $\frac{12500 \text{ ml}}{100 \text{ ml}} \times 0.2 \text{ grams} = 25$ grams chlorine is needed per bucket.

  Liquid bleach is assumed to contain 4% or 4 grams of chlorine per 100 millilitres,

  therefore 25 grams X 100 millilitres/4grams = 6.25 X 100 millilitres =625 millilitres of 4 grams liquid bleach must be added to 12.5 litres of water to make a 0.2 per cent solution of chlorine.

  So, 625 millilitres of liquid bleach must be added to each bucket of water.

- Mix the water and bleach well, before use.

Calcium hypochlorite or HTH

Calcium hypochlorite or high test hypochlorite (HTH or HTHC) comes as white granules and can often be bought from a local ministry of health office or from commercial warehouses and pharmacies. Calcium hypochlorite is much

stronger than liquid bleach and does not lose strength so quickly. Calcium hypochlorite comes in various forms which can have from 20 to 70 per cent chlorine. Fact Sheet 2.19 covers calcium hypochlorite in more detail.

The best type of calcium hypochlorite to use is high test hypochlorite (HTH or HTHC), as this normally contains 50 to 70 per cent chlorine. Always check with the supplier or on the side of the container to be sure of the percentage chlorine content. Make the chlorine solution as described in Box 2.

Box 2. Using calcium hypochlorite to make a chlorine solution

- Fill three plastic buckets with clean water to about 5 cm from the top to allow for the calcium hypochlorite to be added. Most commercially available buckets hold 12.5 litres, but the quantity of water should be checked.

- Add enough calcium hypochlorite to each bucket to make up a 0.2 per cent solution of chlorine.

  Example : Capacity of bucket, 12.5 litres water = 12500 millilitres.

  Need 0.2% or 0.2 grams of chlorine per 100 millilitres of water,

  therefore $\frac{12500 \text{ ml}}{100 \text{ ml}} \times 0.2 \text{ grams} = 25 \text{ grams}$ chlorine is needed per bucket.

  If calcium hypochlorite contains 50% chlorine or 50 grams of chlorine per 100 grams of powder, then 25 grams (the amount of chlorine needed per bucket) is contained in

  $\frac{25 \times 100}{50} \text{ grams} = 50 \text{ grams}$ of powder.

  Therefore, 50 grams calcium hypochlorite must be added to 12.5 litres of water to make a 0.2 per cent solution of chlorine.

  So, 50 grams of calcium hypochlorite should be added to each bucket of water.

- Mix the water and calcium hypochlorite well and leave to dissolve for an hour. Some white sediment will sink to the bottom of the bucket ; only the clear liquid should be used to disinfect the tanker truck and the sediment should be thrown away.

Water supply for tanker trucks

If the water supply to be used is not chlorinated, then enough chlorine disinfectant should be added to the tanker to get a free chlorine residual of 1-1.5 mg/l. The level of free chlorine can be measured using a chlorine tester (see Figure 1).

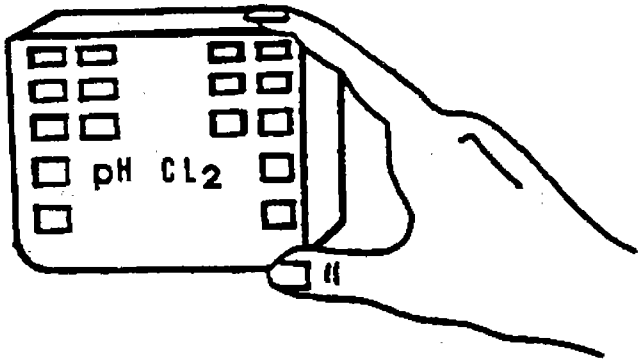

Figure 1. Pocket chlorine tester

Testing for bacteria

Tankers used for transporting drinking water should be tested for bacteriological contamination every month. If, some days after disinfection, a tanker still has high levels of contamination it may be necessary to chlorinate every load or change the source of water. Where chlorinated supplies are delivered, the level of chlorine in the water of each load should be checked using a pocket tester.