



# Well Disinfection Kit

## User Manual

### Purpose

The Well Disinfection Kit consists of two components and is used to disinfect the well with chlorine dioxide and lowers the pH of well water. Please read the MSDSs prior to mixing. AVOID inhaling the fumes of the mixed Well Disinfection Solution, and AVOID making skin contact with the Well Disinfection Solution, as it is acidic and oxidizing.

This Well Disinfection Solution should be used in cases of bacterial contamination. This solution is used to disinfect wells, and it can also be used for well cleaning. The mixed Well Disinfection Solution's cleaning power is not as potent as the Well Cleaning Solution. If both solutions are to be used together, then it is recommended that the Well Cleaning Solution be used first, followed by the Well Disinfection Solution, subdivided by a good well flush in between applications.

### Calculations

When a full 20 l delcan is used, it is sufficient to shock 6 m<sup>3</sup> of water with a concentration of about 2 ppm, considering an allowance for chlorine dioxide consumption. At the same time with 6 m<sup>3</sup> of water, assuming full dissociation in *distilled* water (i.e. no pH buffer capacity), the expected pH will be around 2.4. But, due to the buffer content of well water, it will be more realistic to expect a pH of about 6. The pH obviously will be different for each well and each type of water.

Based on the data described above, it is recommended to use one 20 l delcan per 3 m<sup>3</sup> of well water.

The amount of chemical needed in a well will obviously depend on the water content of the well, and hence on the diameter of the well. Table 1 shown below provides measurements that aid in estimating the volume of water for wells with differing diameters:

Table 1: Calculation of the well water volume in litres.

Water Height (m)	Dia. 4"	Dia. 6"	Dia. 8"	Dia. 10"	Dia. 1'	Dia. 2'	Dia. 3'
5	40	80	150	240	340	1,360	3,050
10	80	170	300	470	680	2,720	6,110
15	110	250	450	710	1,002	4,070	9,160
20	150	340	600	940	1,360	5,430	12,220

**Wells that contain less than 100 l of water should not be treated with the full amount of solution.** As a rule of thumb, for *each 3 m<sup>3</sup> of well volume, 1 delcan (20 l)* of mixed solution should be used. **For wide and shallow wells, please adequately mix the well's contents once the disinfectant is in!**

**In case of severe microbiological contamination, the amount of applied chemicals should be doubled.**

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## **Mixing Instructions**

1. Pour the contents of the bottle labelled “Well Disinfection Solution A” into the delcan labelled “Well Disinfection Solution B”. Close the delcan tightly.
2. Shake the black delcan and let rest for 20-30 minutes. During this time, the disinfectant (chlorine dioxide) develops. If the solutions are cold (less than ambient temperature), wait an additional 10 minutes.

## **Application**

1. Insert a hose into the well (a garden hose will do the job). Try to reach the area of the well screen. Prime the hose with water and syphon the Well Dleaning solution through the hose to the bottom of the well. If the spacing in the well is sufficient to get the hose past the pump, you may leave the well pump in, so that it cleans at the same time. The solution will not visibly corrode stainless steel during the time in which it is applied.\*

***\*The recommendation about not lifting the well pump applies only if the well disinfection solution will be kept in the well for no more than 2 hours.***

2. Circulate (or mix) the solution in the well and let the solution act for 1 - 2 hours, then flush it out with the well pump. The water used for disinfection usually contains some of the scaling and detached bacteria “biofilm” of the well. This water must be wasted and is not suitable for use.
3. If well contamination is severe, the larger amount of well disinfection solution should stay in the well longer, potentially up to 10 hours.
4. Also, it is recommended after the first hour to add 50 to 100 l of disinfected water to the top of the well in order to push the chemical further into the aquifer.
5. When the disinfection procedure is finished, it is recommended to pump water out of the well until the pH of the water returns to its original value.
6. The tablets allow for the testing of the presence chlorine dioxide. As long as they turn pink, chlorine dioxide is present in measurable quantities.
7. In case the problem is not solved from the first attempt, the procedure should be repeated.

In order to prevent the well from being contaminated, disinfect the well once a year with Osorno’s Well Disinfection Solution, which is also acidic, thus it will clean the well screen (dissolve carbonate deposit) while disinfecting it.

Remember that the Bleach (Hypochlorite) that is used for shock disinfection of wells is alkaline, and that a high concentration of Bleach will increase the pH to the extent that carbonates and other minerals will precipitate on the well screen, and eventually will plug the well screen.

***Use common sense when handling this or any other chemicals. Always read the MSDS prior to application.***

***Please contact Osorno if any questions will come up during the well cleaning procedure.***