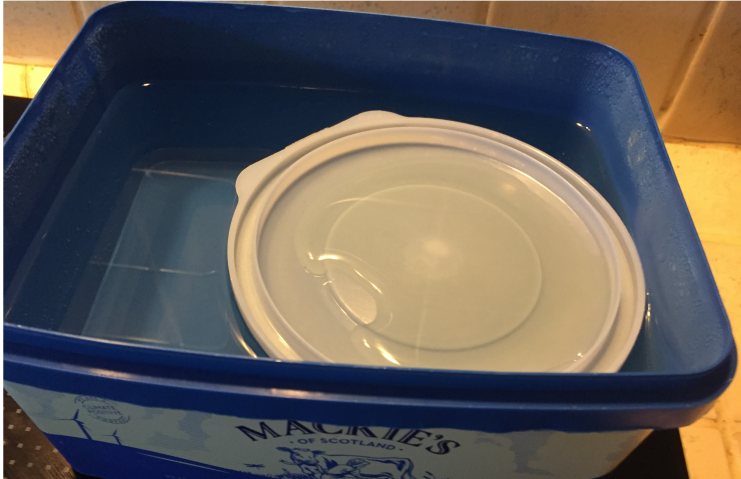
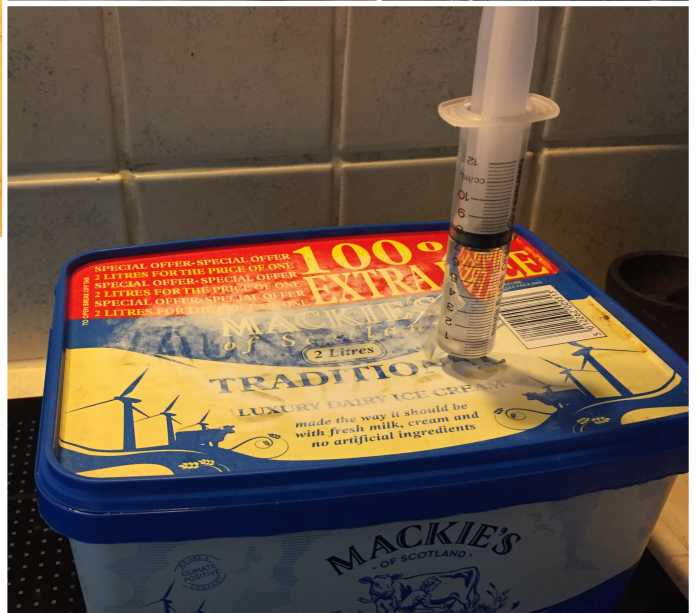


# efficient CDS Method

- Put **1½ litres of warm water** into the main container
- Weigh **10g of NaClO<sub>2</sub>** into the shot glass
- Add **about 10ml of the warm water** (more if necessary) and stir until dissolved
- Float the reaction vessel on the warm water and gently pour in the sodium chlorite solution

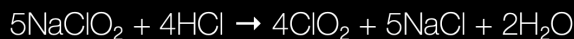


- Place the lid on the main container with the hole over the reaction vessel
- Measure **6ml 36% HCl** into the syringe
- Place the syringe into the hole in the lid and gently squeeze a drop or two in; you will hear the reaction taking place
- The lid will bulge as the gas is generated; wait some minutes until the bulge subsides and then gently add more acid
- You will find that you can add more acid each time and the warm water will quickly dissolve the ClO<sub>2</sub> gas but ensure that the lid does not pop off



This spreadsheet calculates the amount of precursors that you need to produce a certain amount of chlorine dioxide solution (CDS) of a certain concentration.

If this spreadsheet is not functioning as expected, please email [realising.potential@icloud.com](mailto:realising.potential@icloud.com)



## CDS

fill in the data in the red cells, the results will be shown in the green cells  
use these quantities of precursors to produce the desired amount and concentration of CDS  
use the loss offset adjustment to compensate for inevitably vented gas

1500	ml of	3000	ppm	plus an allowance of	5	%
enter volume of CDS desired			3000 ppm is standard; 3500 and 4000 are also used		this offsets for losses	

## Stock solutions

10 g NaClO<sub>2</sub> solution or powder 4,725

### sodium chlorite—NaClO<sub>2</sub>

9,97	g of	100%	concentration—without additives?	<input type="checkbox"/>	1,80
calculated amount needed		insert the concentration and tick the box if it is clear that this is <i>actual</i> NaClO <sub>2</sub> content rather than the proportion of technical grade powder used. 22,4% is standard, being 28% W/W of powder that is 80% pure NaClO <sub>2</sub> ... but other concentrations are sold. remember to use ". " for decimal points!			

### hydrochloric acid—HCl

6,07	ml of	36%	concentration	<input type="checkbox"/>	1,276
calculated amount needed		insert the concentration of acid please do not delete, overwrite or alter the equations in the green cells!			

cells F7 & F10 show the approximate specific gravity (density) of the stock solutions  
cells F6 & F9 show the number of ml of the stock solutions necessary to produce one gramme of ClO<sub>2</sub>  
cell F5 is the number of grammes of ClO<sub>2</sub> in the final target solution  
cell F11 is the proportion of the total volume that is the target solution, ie not the reagents  
cells E5, E6 & E9 are [hidden] values for the molecular masses of ClO<sub>2</sub>, NaClO<sub>2</sub> and HCl  
if bright red cell appears at E10, extreme caution is advised as concentrations may cause aggressive reactions

•Once all of the acid has been injected into the reaction chamber, leave the container alone for a few hours

•The syringe can be removed and the hole sealed with a piece of tape

•When the reaction has completed and the container cooled to near room temperature, place the unit in the fridge, preferably overnight

•Once chilled (below 11°C), carefully remove the container from the fridge and in a well ventilated space, carefully remove the lid and the reaction chamber with the reagents, checking that the colour of the solution in the reaction chamber is similar to that in the main chamber

•Decant the CDS into bottles, seal and return to the fridge

•The reagents can be used separately as usual for cleaning acid-tolerant surfaces