

## How to make chlorine solutions for environmental disinfection

### Example I - Using Liquid Bleach

Chlorine in liquid bleach comes in different concentrations. Any concentration can be used to make a dilute chlorine solution by applying the following formula:

$$\left[ \frac{\% \text{ chlorine in liquid bleach}}{\% \text{ chlorine desired}} \right] - 1 = \text{Total parts of water for each part bleach}^\dagger$$

Example: To make a 0.5% chlorine solution from 3.5%<sup>‡</sup> bleach:

$$\left[ \frac{3.5\%}{0.5\%} \right] - 1 = 7 - 1 = 6 \text{ parts water for each part bleach}$$

Therefore, you must add 1 part 3.5% bleach to 6 parts water to make a 0.5% chlorine solution.

† “Parts” can be used for any unit of measure (e.g. ounce, litre or gallon) or any container used for measuring, such as a pitcher.

‡ In countries where French products are available, the amount of active chlorine is usually expressed in degrees chlorum. One degree chlorum is equivalent to 0.3% active chlorine.

### Example II - Using Bleach Powder

If using bleach powder,<sup>†</sup> calculate the amount of bleach to be mixed with each litre of water by using the following formula:

$$\left[ \frac{\% \text{ chlorine desired}}{\% \text{ chlorine in bleach powder}} \right] \times 1\,000 = \text{Grams of bleach powder for each litre of water}$$

Example: To make a 0.5% chlorine solution from calcium hypochlorite (bleach) powder containing 35% active chlorine:

$$\left[ \frac{0.5\%}{35\%} \right] \times 1\,000 = 0.0143 \times 1\,000 = 14.3$$

Therefore, you must dissolve 14.3 grams of calcium hypochlorite (bleach) powder in each litre of water used to make a 0.5% chlorine solution.

† When bleach powder is used; the resulting chlorine solution is likely to be cloudy (milky).

### Example III - Formula for Making a Dilute Solution from a Concentrated Solution

$$\text{Total Parts (TP) (H}_2\text{O)} = \left[ \frac{\% \text{ Concentrate}}{\% \text{ Dilute}} \right] - 1$$

Example: To make a dilute solution (0.1%) from 5% concentrated solution.

$$\text{Calculate TP (H}_2\text{O)} = \left[ \frac{5.0\%}{0.1\%} \right] - 1 = 50 - 1 = 49$$

Take 1 part concentrated solution and add to 49 parts boiled (filtered if necessary) water.