



# HALAMID® MEASURING CONCENTRATIONS AND NEUTRALIZATION

Halamid® is an active chlorine compound, (but not a hypochlorite releasing compound), thus you can easily determine Halamid® concentration in water by measuring the active chlorine content in solution.

To determine the Halamid® concentration, you need a method able to measure both the “free chlorine” and the “total chlorine” concentrations in water. Different equipment is available to measure Halamid® concentration in aqueous solutions. On request we will recommend the most suitable system for your own application.

## Definitions

**Free chlorine** is the proportion of chlorine present in the form of  $\text{Cl}_2$ ,  $\text{HClO}$  and  $\text{ClO}^-$ .

**Bound chlorine** is present in the form of chloramines as well as organic chloramines (such as Halamid®). In Halamid® solutions, the only bound chlorine product is Halamid® itself.

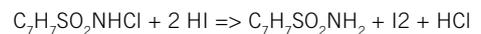
**Total chlorine** is the sum of free and bound chlorine.

The three concentrations are expressed as  $\text{mg Cl}_2/\text{l}$  (ppm).

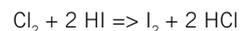
## Halamid®: active chlorine content

To start with, it is important to understand that Halamid® has a theoretical active chlorine content of 25.2%. This can be explained as follow:

The reaction between Halamid® and iodide liberates iodine:



This is comparable to the reaction of free chlorine with iodide:



The amount of active chlorine is expressed in terms of elemental chlorine that would have similar oxidizing power. Thus with Halamid®, one atom of chlorine (one molecule of Halamid®) liberates as much iodine as two atoms of elemental chlorine ( $\text{Cl}_2$ ).

So for the pure Halamid® (chloramine-T trihydrate,  $M = 281.7$ ), the active chlorine is:  
 $2 \times (35.5 / 281.7) = 25.2\%$

(35.5 is the molar mass of  $\text{Cl}_2$ )

This 25.2% active chlorine content is for the pure trihydrate form. It can slightly vary depending of the amount of crystalline water.

Therefore the Halamid® concentration in solution is directly related to the active chlorine one. Active chlorine being easy to determine, the main methods to measure Halamid® concentration are based on the active chlorine measurement.

## Measurement of Halamid® concentrations

To determine the residual Halamid® concentration in water:

- Measure free chlorine concentration.
- Measure total chlorine concentration.
- Calculate (total chlorine) – (free chlorine). This is the bound chlorine concentration in your water (expressed as mg Cl<sub>2</sub>/l).
- Multiply this value by 3.97. This will give you the residual Halamid® concentration expressed as its initial form (the tri-hydrate compound).

To make it easier, you can multiply the bound chlorine concentration by 4 instead of 3.97. The error on the final concentration is then less than 1%.

*Remark:* Halamid® solutions contain only a negligible quantity of free chlorine.

## Neutralization

It is sometime necessary to neutralize Halamid®, for example in microbiological efficacy test to control the reaction time or before discharge of a Halamid® solution. The easiest way is to add a reducing agent to the Halamid® solution. Thiosulfate is certainly the most widely used compound for this.

**Use biocides safely.  
Always read the label  
and product information  
before use.**

**Halamid® is an  
Axcentive product  
available in various  
packages, from  
2 kg buckets to  
1000 kg big bags.**

axcentive

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