

# BLEACH INACTIVATION OF LIQUID BIOLOGICAL WASTES

## 1.0 PURPOSE

This document provides guidance on the approved process of inactivating liquid biological materials using bleach.

## 2.0 BACKGROUND

Sodium hypochlorite, (active ingredient in bleach - NaClO) is a broad-spectrum disinfectant that is effective for the disinfection of viruses, bacteria, fungi, and mycobacterium. However, sodium hypochlorite is **NOT** effective in the disinfection of bacterial spores and prions.

When using chemicals as inactivation agents, the following three parameters must be known and understood:

- The final concentration of the disinfectant needed
- The contact time required for inactivation
- When the solution was prepared

### 2.1 FINAL CONCENTRATION AND DILUTIONS

Bleach strength is measured by the concentration of NaClO. The appropriate concentration of sodium hypochlorite required for disinfecting general liquid biological waste is 5,000 ppm, approximately 0.5%. For biological waste containing a high organic load (e.g., blood, proteins, or lipids) the appropriate concentration of sodium hypochlorite is 10,000 ppm or 1%.

Household bleach is 5 - 6 % sodium hypochlorite meaning that treatment dilutions of bleach to these wastes would be:

- 1:10 (v/v) bleach to waste – for general liquid biological waste
- 1:5 (v/v) bleach to waste – for high organic load liquid waste

### 2.2 CONTACT TIME

Contact time refers to the time that the inactivating agent is physically touching (in contact with) the material that needs to be inactivated. Liquid disinfection requires that enough bleach is added to the liquid material requiring inactivation such that the final NaClO concentration is 10,000 ppm or 1:5 (v/v). To ensure appropriate contact times are met, UW's minimum standard for contact time is that liquid waste is left to stand for 12 hours before disposal.

## 2.3 STABILITY AND STORAGE

The efficacy of bleach continuously diminishes over time. Diluted bleach loses its efficacy within 24 hours, meaning the fresher the bleach solution used, the better. According to Clorox, undiluted household bleach has a shelf life of six months to one year from the date of manufacture, after which bleach degrades at a rate of 20% each year until degraded to salt and water, and a 1:10 bleach solution has a shelf life of 24 hours.

- When determining how much bleach to put into a container, consider the maximum total volume of liquid being treated so the **final concentration** of bleach is known.

## 2.4 IMPORTANT NOTES

Discount brands of bleach may have lower concentrations of sodium hypochlorite and "colour safe" bleach contains **no sodium hypochlorite** (hydrogen peroxide) and **should not be used** for the disinfection of biological waste. Sodium hypochlorite is known to be corrosive to metals, making it important to wipe down metal surfaces with water or ethanol after treating them with a bleach solution.

## 2.5 PERSONAL PROTECTIVE EQUIPMENT

All work with biological agents requires the use of the minimum following protective equipment:

- Hand protection – nitrile gloves or equivalent
- Eye protection – wrap-around safety glasses or safety goggles
- Torso protection – use of lab coats

## 2.6 DRAIN DISPOSAL

Provided the requirements of this guide are met (concentration, compatibility and contact time), liquid biohazardous waste treated with bleach may be disposed of down the drain.

**Note:** Liquid biohazardous wastes that contain mercury or radioactive materials are prohibited from disposal down the drain. After inactivation, these materials should be labelled and brought to the ESF for final disposal.