
*Health Standards and
Guidelines for Sensory
Deprivation Tanks*

I. *Introduction*

Sensory Deprivation tanks (floatation tanks) are small, self contained tanks containing approximately 12 inches of water with a high epsom salt concentration. The customer floats in a salt water solution in darkness and solitude.

These tanks are not regulated under the Swimming Pool Regulation, however, there are health risks associated with their use. Some bacteria, particularly *Pseudomonas aeruginosa*, are able to thrive at water temperatures over 30°C and exposure may result in an infection such as a skin rash or an eye infection. Most infections are minor and self-limiting but can be quite severe in some cases. (4)

The following aspects of sensory deprivation tank operation and design complicate the operators ability to adequately clean and disinfect the tank contents.

- Standard pool disinfectants are less effective under these high salt conditions.
- The tank is not drained regularly since the epsom salt mixture is expensive and there is often no bottom drain to facilitate dumping.
- Chemical test kit results may be inaccurate.
- If ventilation in the tank is poor, it may lead to a buildup of trihalomethanes, carbon dioxide and humidity.
- There is no filtration or mixing during usage because the recirculation system is shut down to provide a quieter environment (enhance sensory deprivation) and to prevent stimulation of the automatic bladder release effect and contamination of the water with urine or other body secretions.
- Although the high salt content (usually $MgSO_4$) and the corresponding low water activity do not favour bacterial growth, some pathogens may survive and even flourish.
- There is no automatic disinfection.

* This document is intended to be used in conjunction with the main document "Health Standards and Guidelines for Personal Services".

II. Operational Requirements

1. Tank and Recirculation System

- The recirculation system shall be provided with a filter capable of removing insoluble contaminants. A diatomaceous earth filter is recommended, but cartridge filters are acceptable. (1)
- The recirculation system shall be designed to ensure a turnover period of not more than 20 minutes.
- The location and number of inlets and outlets shall ensure that there is adequate recirculation throughout the tank.
- A three inch exhaust vent shall be provided in the ceiling of the tank and a three inch makeup air vent on the opposite side (about one foot above the water line when unoccupied) of the tank to ensure air flow throughout the tank.
- Plastic lines, pumps, etc., should be used in the system to minimize corrosion by the high salt concentration of the water. ⁽¹⁾
- A bottom drain, connected to the sanitary sewer through a backflow prevention device, shall be provided in the tank.

2. Water Chemistry

- A free available chlorine (FAC) residual of 2.0 ppm or greater shall be maintained.

An unstabilized chlorine product should be used for disinfection. Lithium hypochlorite is probably the easiest to use because it dissolves rapidly, requiring less maintenance, and has a lower pH than sodium or calcium hypochlorite.

Other pool disinfectants may not be effective in this environment. Iodine is ineffective against Pseudomonas and stabilized chlorine products become less effective against Pseudomonas with the accumulation of isocyanuric acid. Bromine is not recommended.

- pH shall be maintained between 7.2-8.0 both to maximize the efficacy of the disinfectant and for skin comfort.
- Temperature shall be maintained at 94 degrees F (35C) or less.

3. Operation

- The tank and its associated facilities shall be maintained in a sanitary condition at all times.
- Tests for free available chlorine and pH shall be conducted during the normal operating hours as often as necessary to enable the operator to maintain the FAC at not less than 2.0 ppm or greater and the pH between 7.2 - 7.8. (2)

Due to the high salt concentration, it may be difficult to measure the FAC residual because the colour changes and intensity of colour in the tests are atypical making the colour comparison difficult. Since there are no alternative testing methods, FAC and pH can only be estimated from:

- a) test kit results
 - b) estimated demand and consumption
 - c) experience
 - d) bacteriological results
- If the tank has not been used for a period of time, testing should be conducted prior to use by the next client.

- Bacteriological samples shall be submitted every two weeks to the Provincial Laboratory of Public Health. (Appendix A)

If an unsatisfactory sample is received, the tank shall be closed temporarily, remedial action taken, and another bacteriological sample submitted. The tank shall not be reopened until approval is received from an Executive Officer of the Regional Health Authority.

- The tank and recirculation system shall be drained, thoroughly cleaned and disinfected :

- a) at least every six months,
- b) when bacteriological results are unsatisfactory,
- c) when water clarity is poor,
- d) when the operator is unable to maintain adequate levels of disinfectant residual, or
- e) when the operator deems necessary.

4. Recordkeeping

- A log book shall be maintained which includes the dates, times and results of all tests taken, including free chlorine residuals and pH, the quantities of chemicals added and other related maintenance information.

5. Maintenance Guide

A. Steps Between Clients

1. The interior of the tank should be inspected and cleaned and disinfected as necessary. (see Operations - item 3)
2. Appropriate chemicals should be added to maintain disinfectant levels and proper pH levels.
3. The recirculation system should be running whenever the tank is not occupied, overnight, and for 60 minutes between clients.

B. Weekly Steps

The following procedure should be conducted every week:

1. Cleaning

- a. The interior basin and enclosure of the tank shall be thoroughly cleaned and disinfected while containing the epsom salt solution. (the tank will still contain the salt water)
- b. The recirculation system should be operated for at least 45 minutes to remove the material loosened during cleaning.

2. Clarifying

- a. Pool clarifier should be added to the tank to allow flocculation to remove particulate.
- b. The recirculation system should be operated for at least 45 minutes to remove the floc.
- c. The filter shall be cleaned, backwashed or replaced.

3. Disinfection

- a. Appropriate chemicals should be added to ensure disinfection.
- b. The recirculation system should be operated for an additional 45 minutes following the addition of chemicals to allow adequate contact time with the water for disinfection.

6. General Sanitation

- A nearby shower, with liquid soap and shampoo shall be provided.
- A nearby toilet and handsink shall be provided.
- Tanks shall be placed in a room with smooth floors, walls and ceilings which are impervious to moisture.

- Mechanical exhaust ventilation, which ensures a fresh air supply in the room, should be provided.

7. Personal Hygiene

- Signs shall be provided in both the reception area and sensory deprivation tank room indicating: (1)
 - a) Persons should not use this sensory deprivation tank if they have diarrhea, an infectious skin disease or a medical or physical condition which is affected by the sensory deprivation experience.
 - b) Persons under the influence of drugs or alcohol should not use the deprivation tank.
 - c) Persons shall not pollute the water by spitting, blowing the nose, urinating, defecating or otherwise.
 - d) Only one person at a time shall use the sensory deprivation tank.
 - e) All persons should relieve their bowels and bladder just prior to showering and entering the tank.
 - f) All persons shall take a cleansing shower and shampoo their hair prior to entering the tank.

III. References

- (1) Lilly, John C. The Deep Self. Warner books, 1977
- (2) Public Health Act Swimming Pool Regulation . Alberta Regulation 247/85
- (3) Sensory Deprivation Tanks. Capital Health Authority. November 1994.
- (4) Bassett, W.H. Clay's Handbook of Environmental Health 1992.

Appendix A Sensory Deprivation Tanks

Description

On July 21, 1983, the Provincial Board of Health made the following recommendations:

The sensory deprivation tanks shall be closed when bacteriological samples:

- exceed a standard plate count of 300 per 1 ml at 35°C; or
- exceed a total coliform count of 10 per 100 ml; or
- exceed a faecal coliform count of 1 per 100 ml; or
- exhibit Staphylococcus; or
- exhibit Pseudomonas

Once closed, the sensory deprivation tanks shall also be drained and disinfected. The tank shall remain closed until a further bacteriological water sample has been submitted for analysis and meets the acceptable bacteriological change.

(see Environmental Health Reference Manual for further information)