

# The Commonwealth of Massachusetts

Department of Public Health  
250 Washington Street  
Boston, MA 02108

Department of Environmental Protection  
1 Winter Street  
Boston, MA 02108

**POST THIS NOTICE NEAR EACH SODIUM FLUORIDE METERING PUMP. DO NOT REMOVE OR COVER THIS NOTICE IN ANY WAY.**

## Standard Operating Procedure (SOP) Sodium Fluoride (NaF) Saturators

### Personal Protective Equipment

- 1) When handling sodium fluoride the operator should wear the following personal protective equipment (PPE):
  1. Gauntlet neoprene gloves with cuffs, which should be a minimum length of 12 inches;
  2. Full-face NIOSH approved N-Series Particulate Respirator; and 3. Neoprene Apron. Avoid skin, nose and eye contact.

### Operations

- 1) If well or pump station has been in operation pumping water for at least five to ten minutes, collect a water sample from the state approved representative sample tap. It is usually tapped 100 feet outside the building wall. Test it on your Fluoride laboratory tester according to the recommended instruction. Record concentration in parts per million (ppm) fluoride on the official monthly form, rounded off to nearest tenth of a ppm. For example, round off 0.85 ppm as 0.9 ppm. It is encouraged that more than one sample reading be taken daily.
- 2) Visually or using a calibrated stick check the level or depth of sodium fluoride in the saturator tank. Add 5 to 55 pounds of AWWA and NSF approved sodium fluoride to the saturator top whenever: A) Less than 10 inches of solid sodium fluoride is present (do not count cloudy portion), level off as needed before measuring with a stick, and B) The most recent daily fluoride test result at the 100 foot out tap tested 1.0 ppm or less.
- 3) Never exceed 2 feet in depth of sodium fluoride or it will jam the system. The amount of sodium fluoride added mainly depends on your water production rate in gallons per day. Sodium fluoride is consumed at a rate of approximately 20 pounds per million gallons or 10 pounds per 500,000 gallons, or 2 pounds per 100,000 gallons.
- 4) Adjust the metering pump stroke length or strokes per minute adjustment upward or downward to maintain a 1.0 ppm fluoride (average) in the finished water only after maintaining the proper level of sodium fluoride in the saturator. Normally this adjustment is not made often.
- 5) If a water softener is present on the make-up water line (recommend if total water hardness exceeds 75.0 ppm), it must be regenerated with sodium chloride according to manufacturer's instructions. If a hardness reduction filter is present on the make-up water line, it must be replaced when spent.
- 6) When adding the **white colored compound** do it slowly, without spilling to minimize dust. Turn off the metering pump temporarily for 5 minutes to help avoid air-binding.
- 7) Dispose of used bags properly. Record the amount of sodium fluoride added on the official monthly form in pounds.
- 8) Inspect fluoride-metering pump daily for proper operation and air binding. **ALWAYS bleed or depressurize all pump(s) and piping system(s)** to help avoid operator exposures as necessary, according to manufacturer's recommendations. Always wear gauntlet neoprene gloves with cuffs, which should be a minimum length of 12 inches and a full face shield worn over splash-proof safety goggles.
- 9) Inspect suction and discharge piping or tubing for leaks, especially at fittings and connections. Tighten or replace as necessary after cleaning up spillage.
- 10) Record on the official monthly form the gallons of water produced and amount of make-up water used in the last 24-hour period. If the make-up water volume is low or high, investigate as necessary. For example, if low, was the metering pump air-bound, or if high, did the saturator overflow? A rule of thumb is to expect 50-100 gallons or 6 -13 cubic feet of make-up water consumed per million gallons of water optimally fluoridated.
- 11) Visually inspect external saturator overflow system for presence of saturated sodium fluoride solution if one has been installed. All systems approved after 1985 must include one. It is advised all systems have one installed. Test float activated valve weekly (by lifting it) during the fill process to insure make-up water shuts off.
- 12) Once or twice a year clean out saturator completely according to manufacturer's instructions always wearing gloves, apron, and eye protection. Refill the up-flow type saturator with 200 to 220 pounds of sodium fluoride, and then add make-up water.
- 13) Check to make sure the metering pumps' spring loaded diaphragm type anti-siphon valves or back pressure valves on the discharge line are present. Disassemble and inspect each anti-siphon valve at least every 12 months and sooner if past inspections have found severe deterioration or parts. It must never be removed, to avoid possible siphoning or an overdose of fluoride. If removal is necessary, install a spare immediately! **CAUTION-if a spare is not available, shut off the electric power to the metering pump and remove suction line from saturator until the anti-siphon valve is replaced.**
- 14) Check monthly the metering pump electric interlock or pacing system to insure the fluoride metering pump shuts down completely when the well or pump station is off line. If not practical, do not perform, and seek state assistance.

### Storage

- 1) Store bags of sodium fluoride on pallets off the floor or inside 24 to 36 gallon closed rubber containers to avoid moisture or spillage. Label all bags or containers, "Sodium Fluoride".

### Questions?

Who to Contact	During Work Hours	Outside Normal Working Hours
Department of Public Health	Department of Public Health Office of Oral Health 617-624-6074	617-983-6800 (Via the Mass Division of Epidemiology and Immunization Emergency Call Center)
Department of Environmental Protection	Regional Office OR 617-292-5770	1-888-304-1133 (via Massachusetts Emergency Management Agency (MEMA))

### First Aid and Spills

- 1) If the operator is exposed to sodium fluoride, remove the contaminated clothing and thoroughly rinse the exposed area with water.
- 2) **Any sodium fluoride operator accident requiring overnight hospitalization must be reported by the next business day to MDPH and MassDEP.**
- 3) For Dry Spills clean it up wearing gauntlet neoprene gloves with cuffs, which should be a minimum length of 12 inches; 2. Full-face NIOSH approved N-Series Particulate Respirator; and 3. Neoprene Apron.
- 4) For Wet Spills clean it up wearing gauntlet neoprene gloves with cuffs, which should be a minimum length of 12 inches and a full face shield worn over splash-proof safety goggles.
- 5) Refer to material safety data sheet (MSDS) form for more information and the CDC's *Engineering and Administrative Recommendations for Water Fluoridation* publication for more detailed information on how to properly handle the fluoride compound.

### Optimal Levels

- 1) The recommended optimal fluoride concentration is 1.0 ppm with a permissible increase of 0.2 ppm above or 0.1 ppm below that amount.
- 2) Any fluoride concentration greater than 2ppm must be reported immediately to the MDPH and MassDEP as follows:
- 3) In the event of a fluoride concentration greater than 4.0 ppm, immediately determine and repair the problem. If the problem cannot

be immediately determined shut off the fluoride metering pump until the system is repaired.

- 4) **For concentrations of fluoride greater than 10.0 ppm immediately shut off the fluoride metering pump until state assistance is available.**
- 5) If the concentration of fluoride reaches 30mg/l (30.0 ppm) the water main should be flushed until the concentration is less than 30mg/l.