

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 SILICO-FLUORIDE METERING
SYSTEM. DO NOT REMOVE OR COVER
THIS NOTICE IN ANY WAY.**

Standard Operating Procedure (SOP) Sodium Silicofluoride (Na₂SiF₆) Dry Feeder Metering Systems

Personal Protective Equipment

- 1) When handling sodium silicofluoride, also known as sodium fluorosilicate, always wear
 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 for safety. Avoid skin, nose, and eye contact.

Operations

- 1) Refer to the material safety data sheet (MSDS) form and the CDC's *Engineering and Administrative Recommendations for Water Fluoridation* publication for more detailed information on how to properly handle the fluoride compound.
- 2) Inspect the fluoride dry feeder daily for proper operation and sticking. The agitator mixer should be on and the fluoride solution not overflowing to waste. You should see the white fluoride chemical dropping into the dissolving tank.
- 3) Inspect fluoride metering pump, if so equipped, daily for proper operation and air binding; bleed as necessary according to manufacturer's recommendations. Always wear
 1. Gauntlet neoprene gloves with cuffs, which should be a minimum length of 12 inches; and
 2. Chemical splash goggles for safety.
- 4) When performing any system maintenance **ALWAYS bleed or de-pressurize all pump(s) and piping system(s)** to help avoid operator exposures.
- 5) Inspect discharge piping for leaks, especially at fittings and connections. Tighten or replace as necessary after cleaning up spillage.
- 6) Record on the official monthly form the gallons of water produced and net pounds of sodium silicofluoride used in last 24 hour period. If the pounds of sodium silicofluoride are high or low, investigate as necessary. For example, if low, was the dry feeder sticking; or if high, did the density increase from using a different shipment? A rule of thumb is to expect 13 to 14 pounds of sodium silicofluoride consumed per million gallons of water optimally fluoridated.
- 7) If a pump station has been in operation pumping water for at least 5 to 10 minutes, collect a water sample from the state-approved representative sample tap. It is usually tapped 100 feet outside the building wall. Test sample on your fluoride laboratory tester according to the recommended instructions. 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 1.05ppm as 1.1ppm. It is encouraged that more than one sample reading be taken daily.
- 8) Visually or using the scale reading, check the level or depth of sodium silicofluoride in the dry feeder's hopper. Do not overfill to avoid arching. Add or transfer by vacuum pump the AWWA and NSF approved chemical without spilling when low or when less than a 24 hours supply of sodium silicofluoride remains.
- 9) When adding the sodium silicofluoride (recheck the bag label) to the dry feeder hopper through a mesh or grill screen, **ALWAYS** turn on the outside dust collector system. To prevent jamming do not allow pieces of bag paper to enter the hopper. If lumpy, break up over a mesh screen, **ALWAYS** wear
 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 for safety.
- 10) Keep scale in proper working order and test accuracy semi-annually by adding known weights. Maintain flexible horizontal connectors for overflow; fill, and outlet if solution mixing tank rests on scale for accurate scale readings.
- 11) Adjust the metering pump stroke length or strokes per minute adjustment (if so equipped) upward or downward to maintain a 1.0ppm fluoride (average) in the finished water. If no metering pump is used, adjust the dry feeder calibration knob adjustment upward or downward to maintain a 1.0ppm fluoride (average) in the finished water.

Storage and Cleaning

- 1) Store bags of sodium silicofluoride on pallets off the floor to avoid moisture. The maximum allowable height is six bags.
- 2) Once a year clean out dissolving tank and post dissolving tank if so equipped, to remove undissolved sodium silicofluoride (calcium phosphate). Check tank daily. Warm make-up water helps the dissolving process work more efficiently.
- 3) If a metering pump is used, check to make sure the spring loaded diaphragm type anti-siphon valves or back pressure valves on the discharge line are present. **They must never be removed to avoid possible siphoning or an overdose of fluoride.** If removal is necessary, install a spare immediately! Disassemble and inspect each anti-siphon valve at least every 12 months and sooner if past inspections have found severe deterioration of parts.

CAUTION - If a spare is not available, shut off electric power to the metering pump, and remove suction line or shut off suction line ball valve until the anti-siphon valve is replaced.

- 15) Check monthly the metering pump and/or dry feeder electric interlock or pacing system to insure the fluoride metering pump shuts down completely when the pump station is off line. If not practical, do not perform, and seek state assistance.
- 16) Do not bellow out the empty paper bags; fold the used bags gently and dispose of them in plastic garbage bags.

Optimal Level

- 1) The recommended optimal fluoride concentration is 1.0ppm with a permissible increase of 0.2 ppm above, or 0.1 ppm below that amount.
- 2) Any fluoride concentration over 2.0ppm must be reported immediately to MDPH and MassDEP.
- 3) In the event of a fluoride concentration above 4.0ppm, 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 over 10.0ppm 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.

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))