

<b>TEXAS DEPARTMENT OF STATE HEALTH SERVICES</b>	<b>TR-1</b>	
<b>FLUORIDATION SYSTEM TECHNICAL REQUIREMENTS</b>	Page 1 of 2	
<b>FLUOROSILICIC ACID SYSTEM</b>	Revision 1	May 9, 2005

## 1. Fluoridation System Technical Requirements

- a. The fluoride chemical injection pump shall be wired electrically in series with a main well pump, service pump, or other approved plant control system such that it cannot operate unless water is being produced (interlocked).
- b. It shall be physically impossible to plug a fluoride-metering pump into any continuously active (“hot”) electrical outlet. If the metering pump is not hardwired directly into the electrical circuit providing interlock protection to the well or service pump, then the metering pump shall be equipped with a **special**, clearly labeled plug (6-15P or 6-20P) that is compatible only with a special outlet (6-15R and/or 6-20R) on an appropriate circuit.
- c. Unless otherwise specified, a flow switch, pressure switch, or other approved flow-based secondary interlock device shall be provided as back-up protection in water systems serving less than 500 people. The device shall be electrically interlocked to the metering pump to provide secondary flow-based control.
- d. Fluoride injection should occur where all of the water to be treated water passes; however, fluoride should not be injected where substantial losses of fluoride can occur such as downstream of chlorine injection points.
- e. Fluoride injection into a water line should be located in the lower third of the pipe and the injection quill shall extend a minimum of one-third of the pipe’s diameter into the pipe.
- f. A corporation stop valve with safety chain shall be used at the fluoride injection point when injected into a line under pressure.
- g. A drop out piping spool with isolation valves shall be provided at injection points in a pressured line to allow for the maintenance and inspection of anti-siphon devices and to remove fluoride injection quills.
- h. A minimum of two anti-siphon devices shall be installed on all fluoride metering pumps. One valve shall be located at the fluoride injection point and the other at the metering pump head on the discharge side or as a separate anti-siphon device in the discharge line immediately downstream of the chemical metering pump. Each anti-siphon device shall have a diaphragm that is spring-loaded in the closed position.
- i. The pump shall always be mounted above the day tank using only top penetration suction tubing. The fluoride chemical metering pump shall not be mounted more than 5 feet higher than the lowest normal liquid level in the day tank. **Flooded suction supply lines shall not be used to feed a fluoride chemical injection pump.**
- j. The metering pump should be sized to feed fluoride near the midpoint of its operating range. The pump should be sized to operate between 30% to 70% of capacity.
- k. The pump capacity should be limited to a maximum adjusted fluoride level of 2 mg/l when calculated for the annual average water production rate.
- l. Priming valves on fluoride metering pumps shall be spring-loaded.
- m. A spare pump does not have to be supplied or installed for each size of metering pump used to inject fluorosilicic acid.

<b>TEXAS DEPARTMENT OF STATE HEALTH SERVICES</b>	<b>TR-1</b>	
<b>FLUORIDATION SYSTEM TECHNICAL REQUIREMENTS</b>	Page 2 of 2	
<b>FLUOROSILICIC ACID SYSTEM</b>	Revision 1	May 9, 2005

- n. In line mixers or small mixing tanks shall be installed in the finished water line if the first customer is less than or equal to 100 feet from the fluoride injection point **and** if there is no storage tank located in the line before the water reaches the first customer.
- o. A master meter on the main water service line must be provided on systems adding fluoride.
- p. Fluoride feed lines shall be color coded, when practical, or clearly marked with tags or signage. Pipe that is color-coded shall be painted light blue with red bands in accordance with the Uniform Plumbing Code. The word “fluoride” and the direction of flow shall be painted on the pipe or affixed to the pipe with a label
- q. All hose connections within reach of fluoride feed equipment shall be provided with hose bib type vacuum breakers.
- r. All fluorosilicic acid shall conform to AWWA standard B-703.
- s. Fluorosilicic acid shall not be diluted prior to injection.
- t. No more than a 7-day supply of fluorosilicic acid should be connected at any time to the suction side of a chemical metering pump. All bulk storage tanks with more than a 3-day supply shall have a day tank. A day tank should only contain a small amount of acid, usually a 1 to 3 day supply. The public water supply owner/operator shall seasonally adjust the volume of acid available in the day tank to be pumped to meet the 3-day limit criteria.
- u. Day tanks shall be located on scales; daily weights shall be measured and recorded.
- v. Day tanks and carboys/drums shall be **completely** sealed and vented to the outside. Note that the vent for fluorosilicic acid shall be located high since the vapors produced are lighter than air.
- w. Bulk storage tanks and day tanks shall be provided with secondary containment.
- x. Fluorosilicic acid piping or tubing on the discharge of the chemical metering pump shall have secondary containment, except at the connection to the injection point and at the chemical injection pump.