

**4720.3957 CHEMICAL ADDITION.**

Subpart 1. **Feed equipment required.** If chemical feed such as chlorination, coagulation, or other processes are necessary for the protection of the water supply, a minimum of two feeders must be provided so a standby unit or combination of units is available to replace the largest unit during shutdowns. Spare parts must be available for all feeders to replace parts subject to wear and damage.

Subp. 2. **Design and capacity.** The design of the facility must ensure that:

- A. a separate feed system is provided for each chemical;
- B. feeders supply, at all times, the necessary amounts of chemical at an accurate rate, throughout the range of feed. To allow for changes in pumping or application rates, the feeder must be designed to operate between 30 and 70 percent of the feeder range on initial start-up. If this is not possible with stock chemical solution, the chemical must be diluted;
- C. proportioning of chemical feed to rate of flow is provided;
- D. positive displacement-type solution feeders are used to feed liquid chemicals;
- E. chemical solutions are prevented from being siphoned into the water supply by assuring discharge at points of positive pressure and by providing antisiphon devices, or through a suitable air gap or other effective means approved by the commissioner;
- F. the service water supply is protected from contamination by chemical solutions either by equipping the supply line with backflow or backsiphonage prevention devices, or by providing an air gap of two pipe diameters, but not less than three inches, between the supply line and top of the solution tank;
- G. materials and surfaces in contact with chemicals are resistant to the chemical solution;
- H. dry chemical feeders:
  - (1) measure chemicals volumetrically or gravimetrically;
  - (2) effectively dissolve the chemical in the solution pot;
  - (3) provide gravity feed from solution pots, if possible; and
  - (4) completely enclose chemicals to prevent emission of dust to the operating room; and
- I. no direct connection exists between any sewer and a drain or overflow from the feeder or solution chamber or tank.

Subp. 3. **Location of feed equipment.** Chemical feed equipment must be:

- A. readily accessible for servicing, repair, and observation of operation;

B. located and have protective curbing to prevent chemicals from equipment failure, spillage, or accidental drainage from entering the water in conduits, and treatment or storage basins; and

C. located above grade.

Subp. 4. **Controls.** Feeders must be manually or automatically controlled if the water supply pumps are manually controlled. Where pumps are automatically controlled, the feeders must be automatically controlled. In all cases, automatic control shall be capable of reverting to manual control when necessary.

A. Feeders must be designed and controlled to provide rates proportional to flow.

B. Automatic chemical feed rate control may be used in combination with residual analyzers which have alarms for critical values and recording charts.

Subp. 5. **Weighing scales.** Weighing scales:

A. must be provided to weigh cylinders at all plants using chlorine gas;

B. are required for solution feed unless a comparable means for determining use is approved by the commissioner;

C. are required for volumetric dry chemical feeders; and

D. must be accurate enough to measure increments of 0.5 percent of load.

Subp. 6. **Feed lines.** Feed lines must:

A. be as short as possible in length of run; of durable, corrosion resistant material; easily accessible throughout entire length; protected against freezing; and readily cleanable;

B. slope upward from chemical source to feeder when conveying gases;

C. introduce corrosive chemicals so as to minimize the potential for corrosion;

D. be designed consistent with the scale-forming or solids-depositing properties of the water, chemical, solution, or mixture conveyed;

E. not carry chlorine gas under pressure beyond the chlorine feeder room; and

F. include an injection nozzle when application is into a pipeline.

Subp. 7. **Service water supply.** Water used for dissolving dry chemicals, diluting liquid chemicals, or operating chemical feeders must be from a safe, approved source with appropriate backflow prevention provided. The commissioner may grant an exception in cases where the finished water quality is not affected by addition of the chemical mixed with untreated water.

**Statutory Authority:** *MS s 144.383*

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