**Section 604.1105 Feed Equipment and Chemical Storage**

a) Solution Feed Equipment

1) Corrosion-resistant containers must be provided for solution feeders.

2) Containers must have non-corrodible covers with overhanging edges. Openings must be constructed to prevent contamination.

3) Scales or a volumetric measuring device must be provided for determining the amount of solution fed.

b) Feeder Redundancy

1) When chemical feed is necessary for the protection of the supply, such as chlorination, coagulation, or other essential processes:

A) a minimum of two feeders must be provided with each having adequate capacity to provide the maximum dosage necessary; and

B) the standby unit or a combination of units of sufficient size to meet capacity must be provided to replace the largest unit when out of service.

2) A separate feeder must be used for each chemical applied.

3) Each chemical feeder and day tank must be identified with its content.

4) Spare parts must be available on site for all feeders and chemical booster pumps to replace parts that are subject to wear and damage.

c) Control

1) At automatically operated facilities:

1. The automatic controls must be designed to allow override by manual controls.

B) Chemical feeders must be electrically interconnected with the well or service pump so that they will not operate if the well or service pump is not operating.

2) Chemical feed rates must be proportional to the flow stream to achieve the appropriate dose of chemical application.

3) A means to measure the water flow stream being dosed must be provided to determine chemical feed rates.

4) Provisions must be made for measuring the quantities of chemicals used.

5) Weighing Scales

A) Weighing scales must be capable of providing reasonable precision for the average daily dose.

B) Unless otherwise approved by the Agency under Section 604.145(b), treatment chemicals in a gaseous state must be weighed;

C) Fluoride solution fed from supply drums or carboys must be weighed; and

D) Volumetric dry chemical feeders must be weighed unless otherwise approved by the Agency under Section 604.145(b).

d) Dry chemical feeders must:

1) measure chemicals volumetrically or gravimetrically;

2) provide adequate water and agitation of the chemical within the slurry tank; and

3) completely enclose chemicals to prevent the emission of dust to the operating room.

e) Positive Displacement Solution Pumps

1) Positive displacement type solution feed pumps may be used to feed liquid chemicals, but must not be used to feed chemical slurries.

2) Pumps must be capable of operating at the required maximum rate against the maximum head conditions found at the point of injection.

3) Calibration tubes or mass flow monitors that allow for direct physical measurement of actual feed rates must be provided.

f) To ensure that chemical solutions cannot be siphoned or overfed into the water supply, liquid chemical feeders must:

1) assure discharge at a point of positive pressure;

2) provide vacuum relief; or

3) provide a suitable air gap or anti-siphon device.

g) Cross-connection control must be provided to assure that:

1) the make-up water lines discharging to liquid storage tanks must be properly protected from backflow;

2) no direct connection exists between any sewer and a drain or overflow from a chemical feed system; and

3) all overflows and drains from a chemical field system must have an air gap above the sewer or overflow rim of a receiving sump.

h) Chemical feed equipment location must be readily accessible for servicing, repair, and observation of operation.

i) Make-upwater lines must be:

1) obtained from the finished water supply, or from a location sufficiently downstream of any chemical feed point to assure adequate mixing; and

2) ample in quantity and adequate in pressure.

j) Storage of Chemicals

1) Space must be provided for:

A) at least 30 days of chemical supply;

B) convenient and efficient handling of chemicals;

C) dry storage conditions; and

D) a minimum storage volume of 1.5 times the gross shipping volume.

2) Offloading areas must be clearly labeled to prevent accidental cross-contamination.

3) Chemicals must not be stored in confined spaces.

4) Chemicals must be stored in covered or unopened shipping containers, unless the chemical is transferred into an approved storage unit.

5) Feed equipment and storage chemicals must be stored inside a building unless otherwise approved by the Agency under Section 604.145(b).

6) Liquid chemical storage tanks must have a liquid level indicator.

7) Secondary Containment

A) Liquid chemical storage tanks must have secondary containment consisting of an overflow and a receiving basin capable of receiving accidental spills or overflows without uncontrolled discharge.

B) A common receiving basin may be provided for each group of compatible chemicals that provides sufficient containment volume to prevent accidental discharge in the event of failure of the largest tank. Groups of compatible chemicals are as follows: acids, bases, salts and polymers, absorption powders, oxidizing powders, and compressed gases.

8) Vents from storage tanks must have a corrosion-resistant 24 mesh screen.

k) Bulk Liquid Storage Tanks

1) A uniform strength of chemical solution must be maintained. Continuous agitation must be provided to maintain slurries in suspension.

2) A means to assure continuity of chemical supply must be provided.

3) Means must be provided to measure the liquid level in the tank.

4) Liquid storage tanks including any access openings must be kept securely covered.

5) Overflow pipes, when provided, must:

A) be turned downward, with the end screened;

B) have a free fall discharge; and

C) be located where noticeable.

6) Liquid storage tanks must be vented, but not through vents in common with other chemicals or day tanks.

7) Each liquid storage tank must be provided with a valved drain in accordance with subsection (g).

8) Solution tanks must be located, and protective curbings provided, so that chemicals from equipment failure, spillage, or accidental drainage do not enter the water in conduits or treatment or storage basins. Chemicals must be stored as required by subsection (j)(5).

l) Day Tanks

1) Day tanks must be provided where bulk storage of liquid chemical is provided.

2) Day tanks must meet all the requirements of subsection (k), except that shipping containers do not require overflow pipes and subsection drains.

3) Day tanks must be scale‑mounted or, if the liquid level can be observed in a gauge tube or through translucent sidewalls of the tank, have a calibrated gauge painted or mounted on the side. In opaque tanks, a gauge rod may be used. The ratio of the area of the tank to its height must be such that unit readings are meaningful in relation to the total amount of chemical fed during a day.

4) Except for fluosilicic acid, hand pumps may be provided for transfer from a shipping container. When motor driven transfer pumps are provided, a liquid level limit switch must be provided.

5) Tanks and tank refilling line entry points must be clearly labeled with the name of the chemical contained.

6) Filling of day tanks must not be automated.

m) Feed lines must be:

1) of durable, corrosion‑resistant material;

2) protected against freezing;

3) designed to prevent clogging; and

4) color-coded and labeled in accordance with Section 604.120.

n) Handling. Provision must be made for the proper transfer of dry chemicals from shipping containers to storage bins or hoppers, in such a way as to minimize the quantity of dust that may enter the room.

o) Housing

1) Floor surfaces must be smooth and impervious, slip-proof, and well-drained.

2) Vents from feeders, storage facilities, and equipment exhaust must discharge to the outside atmosphere above grade and remote from air intakes.

(Source: Amended at 47 Ill. Reg. 7503, effective May 16, 2023)