

4720.3965 DISINFECTION.

Subpart 1. **Chlorine.** Chlorine must be the principal agent used to disinfect the water supply. Other agents may be approved by the commissioner on a case-by-case basis provided reliable feeding equipment is available and testing procedures for a residual are recognized in the 16th edition of Standard Methods for the Examination of Water and Wastewater (1985). This edition is incorporated by reference, is not subject to frequent change, and is available through the Minitex interlibrary loan system.

Subp. 2. **Equipment.** A gas chlorinator or a positive displacement hypochlorite feeder must be provided by the supplier.

Subp. 3. **Capacity.** The chlorinator capacity must provide that a free chlorine residual of at least two mg/1 is attained in the water after a contact time of at least 30 minutes when maximum flow rates coincide with anticipated maximum chlorine demands. The equipment must be designed to operate accurately over the desired feed range.

Subp. 4. **Standby equipment.** Where chlorination is needed to protect the water supply, standby equipment of sufficient capacity must be available to replace the largest unit during shutdowns.

Subp. 5. **Automatic proportioning.** Automatic proportioning chlorinators are required where the rate of flow is not reasonably constant or where the rate of flow of the water is not manually controlled.

Subp. 6. **Contact time and point of application.** To determine the contact time of the chlorine in water, ammonia, taste-producing substances, temperature, bacterial quality, trihalomethane formation potential and other pertinent factors must be considered. All basins used for disinfection must be designed to minimize short circuiting.

A. At plants treating surface water, provisions must be made for applying chlorine to the raw water, settled water, filtered water, and water entering the distribution system. The contact time required in item B must be provided after filtration.

B. Surface water supplies using free residual chlorination must provide a minimum contact time of two hours. When combined residual chlorination is used for surface water supplies, a minimum of three hours contact time must be provided.

Subp. 7. **Residual testing equipment.** Residual testing equipment must measure residuals to the nearest 0.1 mg/1 in the range below 0.5 mg/1 and to the nearest 0.2 mg/1 between 0.5 mg/1 to 2.0 mg/1.

Subp. 8. **Chlorinator piping.** The water supply piping must be designed to prevent contamination of the treated water supply by water sources of impure or unknown quality.

Subp. 9. **Housing.** Chlorine gas feed and storage must be:

- A. separated from other operating areas by gas-tight enclosures to prevent injury to personnel and damage to equipment;
- B. provided with an inspection window installed in an interior wall or exterior door to permit viewing of the interior of the room and the equipment;
- C. provided with doors having emergency or panic hardware and opening outward to the building exterior;
- D. heated to prevent freezing and insure proper operation of the equipment;
- E. provided with restraints to prevent movement of the chlorine cylinders; and
- F. designed so the ejector for mixing chlorine gas and water is located in the chlorine room where chlorine gas under pressure is used.

Subp. 10. **Ventilation of chlorine rooms.** One complete air change a minute must be provided when the chlorine room is occupied. In addition:

- A. the exhaust fan suction must be near the floor with the point of discharge located to avoid contamination of air inlets to other rooms and structures or blockage by snow or other obstructions;
- B. air inlets must be located near the ceiling and controlled to prevent adverse temperature variation;
- C. the exhaust fan switch must be located at the entrance to the chlorine room with a signal light indicating fan operation when the fan is controlled from more than one point; and
- D. vents from feeder and storage units must discharge to the outside atmosphere, above grade as indicated in item A.

Subp. 11. **Ammoniation.** Housing and ventilation for ammoniation must be provided as specified in subparts 9 and 10. Ammonia storage and feed facilities must be separate from chlorine facilities because of the combustion hazard. A plastic bottle of hydrochloric acid must be available and used for leak detection.

Statutory Authority: *MS s 144.383*

History: *15 SR 1842*

Published Electronically: *October 27, 2003*